REGIONAL FLOOD MANAGEMENT PLANNING

FloodSAFE CALIFORNIA

Feather River Region

Regional Flood Atlas–Draft

May 2013

Regional Flood Management Planning

The California Department of Water Resources (DWR) has launched the Regional Flood Management Planning effort to work with local entities to collect on-the-ground information and to use existing technical studies to formulate feasible projects, assess the performance of the projects, and develop a plan that reflects the vision of local entities in reducing flood risks in their region. DWR plans to provide guidance, as well as technical and financial assistance, to local agencies to prepare regional flood management plans that formulate and prioritize the proposed projects in each region. Regional Flood Management Planning is an important first step in refining and implementing the 2012 Central Valley Flood Protection Plan.

Though the 2012 CVFPP identifies nine regions (Upper Sacramento, Mid-Sacramento, Feather River, Lower Sacramento, Delta-North, Delta-South, Lower San Joaquin, Mid-San Joaquin, and Upper San Joaquin), the majority of the regions have partnered together, resulting in six regions. These six regions are the Upper/Mid-Sacramento River, Feather River, Lower Sacramento River/Delta North, Lower San Joaquin River/ Delta South, Mid-San Joaquin River, and Upper San Joaquin River.

Each of the six planning regions has formed a working group that is led by a local agency and consists of representatives from flood management agencies, land use agencies, flood emergency responders, permitting agencies, and environmental and agricultural interests. The regional plans will present local agencies' perspectives of flood management with a prioritized list of projects that need to be implemented to reduce flood risks in each region. Each plan will also present an assessment of the proposed project costs and benefits, considering potential contributions to an integrated and basin-wide solution.

Regional Flood Atlas

During the development of the 2012 Central Valley Flood Protection Plan (CVFPP) the areas protected by the facilities of the State Plan of Flood Control (SPFC) were organized into flood planning regions to account for the variations in land use conditions, flood protection facilities, and flood hazards. Through the regional planning process, FloodSAFE will work with local partners to identify and prioritize proposed regional flood system improvements for each of the six flood planning regions.

This Regional Flood Atlas is primarily graphic depictions of the flood risk characteristics and hazards of the region. The Regional Flood Atlas was compiled from existing data to share understanding and to facilitate discussions about the "current state" of flood risks in the region. The Regional Flood Atlas is a compilation of several ongoing efforts within DWR. The information in the Regional Flood Atlases is a snapshot of those on-going efforts. The Atlas is not intended to serve as a comprehensive environmental setting section under CEQA or NEPA.

During the course of the regional planning effort, additional regional information will be gathered from local agencies to more fully identify the regional flood risk. New information obtained through these meetings and workshops will be used to update the Regional Flood Atlases. When complete, the Final Regional Flood Atlases will be appended to the Draft and Final Regional Plans.

The Feather River Region includes areas protected by SPFC levees (project levees) near the Feather, Yuba, and Bear Rivers above Verona. This region's land use is primarily rural, but does include several urban areas including Biggs, Gridley, Live Oak, Marysville, Yuba City, Olivehurst, and Linda.

The following list of maps has been identified for inclusion in the Feather River Regional Flood Atlas:

Map 1 Regional Overview – This map identifies the boundaries and map extent for the Region.

Map 2 Protected Populations and Assets – This map identifies the distribution of protected populations and assets in the Central Valley.

Map 3 Levee Flood Protection Zones –This map shows areas within the Region protected by the facilities of the SPFC.

Map 4 Local Jurisdictions – This map shows the city and county boundaries and will be used to identify the local land use planning authority in order to identify the appropriate land use-based roles and responsibilities.

Map 5 DWR Integrated Regional Water Management Planning Areas – This map identifies the DWR Integrated Regional Water Management Planning Regions that coincide with the Flood Planning Region.

Map 6 General Land Use – This map identifies general land uses, including agricultural, urban and native vegetation. This information will be used to identify flood risks of current and future development in the floodplains.

Map 7 Local Maintaining Agencies – This map identifies the LMA boundaries within the Region.

Map 8 Existing Critical Facilities and Economic Assets – This map identifies highways, primary county roads, railroads, bridges, airports, docks/marinas, hospitals, police stations, firehouses, and schools.

Map 9 SPFC and Local Flood Control Facilities – This map identifies the SPFC and Non-SPFC flood control facilities (levees, weirs, pump stations, canals) that provide flood protection. This information will be used to identify and locate all flood facilities in the Region.

Map 10 Flood Emergency Response Facilities – This map identifies facilities that may be used to support emergency response readiness.

Map 11 Overall Levee Conditions – This map includes the results of inspection reports, Non-Urban Levee Evaluations/Urban Levee Evaluations, and other known/identified deficiencies or areas of poor past performance.

Map 12 Seepage Past Performance Problems – This map includes the results from Flood System Repair Program/Urban Levee Evaluations, showing areas which have experienced seepage issues.

Map 13 Slope Instability Past Performance Problems – This map includes the results from Flood System Repair Program/Urban Levee Evaluations, showing areas which have experienced slope instability issues.

Map 14 Erosion Past Performance Problems – This map includes the results from Flood System Repair Program/Urban Levee Evaluations, showing areas which have experienced erosion issues.

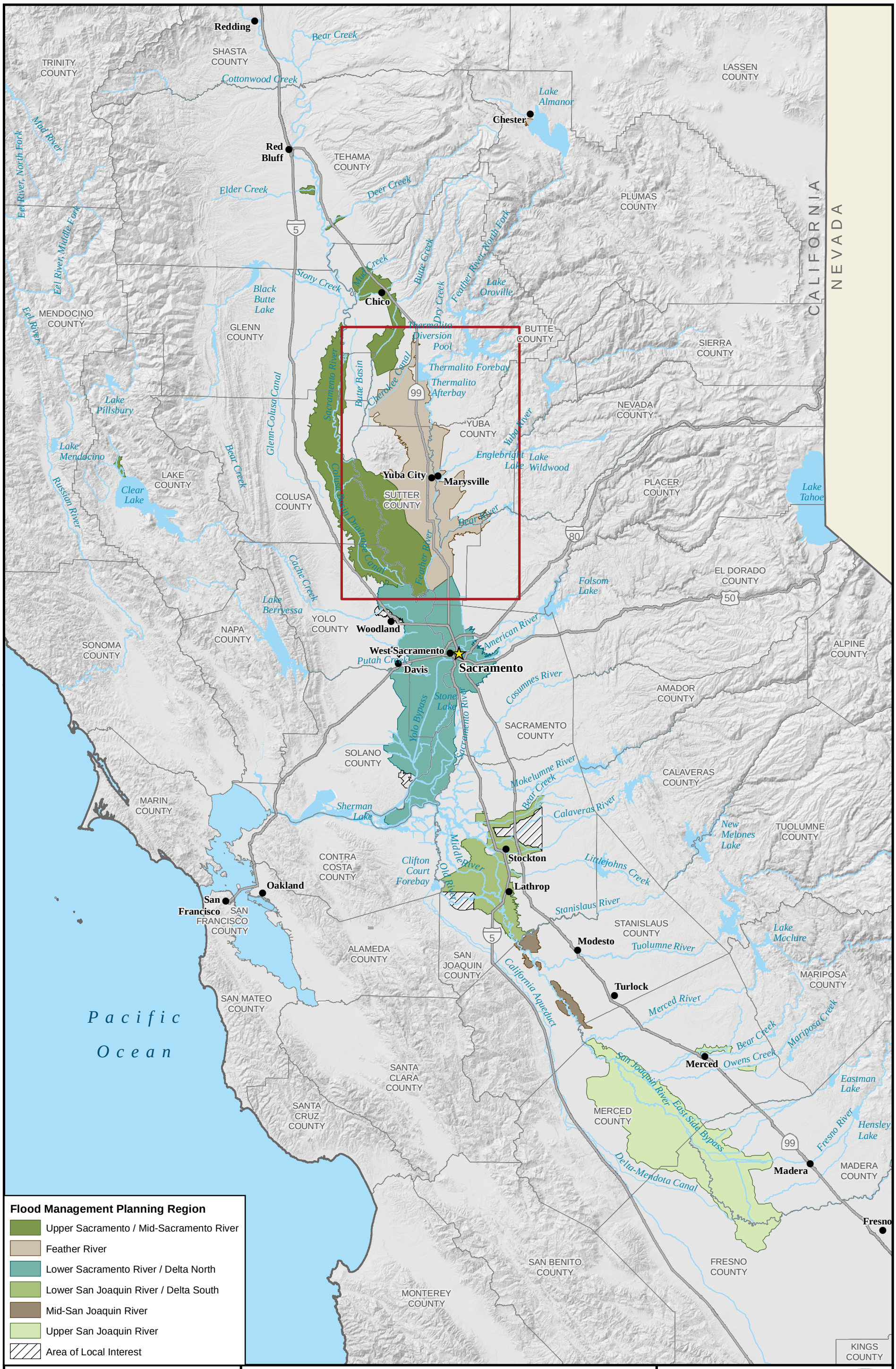
Map 15 Other Past Performance Problems – This map includes the results from Flood System Repair Program/Urban Levee Evaluations, showing areas which have experienced a variety of issues including breaches and overtopping.

Map 16 FEMA 100-Year Floodplain – This map identifies the 100-year flood inundation areas from the FEMA 100-year floodplain.

Map 17 Channel Capacities and Flood Forecast Monitoring Network –This map identifies the current channel capacities of the SPFC. This information will be used to identify the floodways and their capacities within the region.

Map 18 Managed Environmental Lands – This map identifies the wildlife refuge areas and critical habitat areas. This information will be used to map ecologically sensitive areas within the region.

Map 19 Riparian Vegetation, Critical Habitat, and Endangered and Threatened Species – This map identifies riparian vegetation along the rivers and streams affected by the SPFC facilities, and the presence of Critical Habitat or Endangered and Threatened Species within the region.


Redding
Bear Creek
SHASTA COUNTY
TRINITY COUNTY
Cottonwood Creek
LASSEN COUNTY
Lake Almanor
Chester
Red Bluff
TEHAMA COUNTY
Mad River
Eel River, North Fork
Elder Creek
Deer Creek
PLUMAS COUNTY
CALIFORNIA
NEVADA
Eel River, Middle Fork
Stony Creek
Mud Creek
Butte Creek
Feather River, North Fork
Lake Oroville
Black Butte Lake
Chico
Eel River
MENDOCINO COUNTY
GLENN COUNTY
Thermalito Diversion Pool
BUTTE COUNTY
Dry Creek
SIERRA COUNTY
Thermalito Forebay
Thermalito Afterbay
Sacramento River
Butte Basin
Cherokee Canal
Lake Pillsbury
Glenn-Colusa Canal
NEVADA COUNTY
YUBA COUNTY
Yuba River
Lake Mendocino
Bear Creek
Englebright Lake
Lake Wildwood
Yuba City
Marysville
LAKE COUNTY
Clear Lake
COLUSA COUNTY
SUTTER COUNTY
PLACER COUNTY
Lake Tahoe
Russian River
Colusa Basin Drainage Canal
Bear River
Feather River
Cache Creek
Folsom Lake
EL DORADO COUNTY
Lake Berryessa
YOLO COUNTY
Woodland
NAPA COUNTY
American River
SONOMA COUNTY
West Sacramento
Putah Creek
Davis
Sacramento
ALPINE COUNTY
Cosumnes River
Stone Lake
Yolo Bypass
Sacramento River
AMADOR COUNTY
SACRAMENTO COUNTY
SOLANO COUNTY
Mokelumne River
CALAVERAS COUNTY
MARIN COUNTY
Sherman Lake
Bear Creek
Calaveras River
New Melones Lake
TUOLUMNE COUNTY
Middle River
Stockton
Clifton Court Forebay
CONTRA COSTA COUNTY
Littlejohns Creek
Old River
Oakland
Lathrop
San Francisco
SAN FRANCISCO COUNTY
Stanislaus River
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Modesto
ALAMEDA COUNTY
SAN JOAQUIN COUNTY
Tuolumne River
California Aqueduct
Turlock
MARIPOSA COUNTY
SAN MATEO COUNTY
Merced River
Mariposa Creek
Bear Creek
Merced
Owens Creek
Eastman Lake
SANTA CLARA COUNTY
San Joaquin River
East Side Bypass
MERCED COUNTY
Fresno River
Hensley Lake
SANTA CRUZ COUNTY
Delta-Mendota Canal
Madera
MADERA COUNTY
Fresno
SAN BENITO COUNTY
FRESNO COUNTY
MONTEREY COUNTY
KINGS COUNTY
Pacific Ocean
Flood Management Planning Region
Upper Sacramento / Mid-Sacramento River
Feather River
Lower Sacramento River / Delta North
Lower San Joaquin River / Delta South
Mid-San Joaquin River
Upper San Joaquin River
Area of Local Interest
1 " = 20 miles
Miles
0 5 10 20
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Regional Overview
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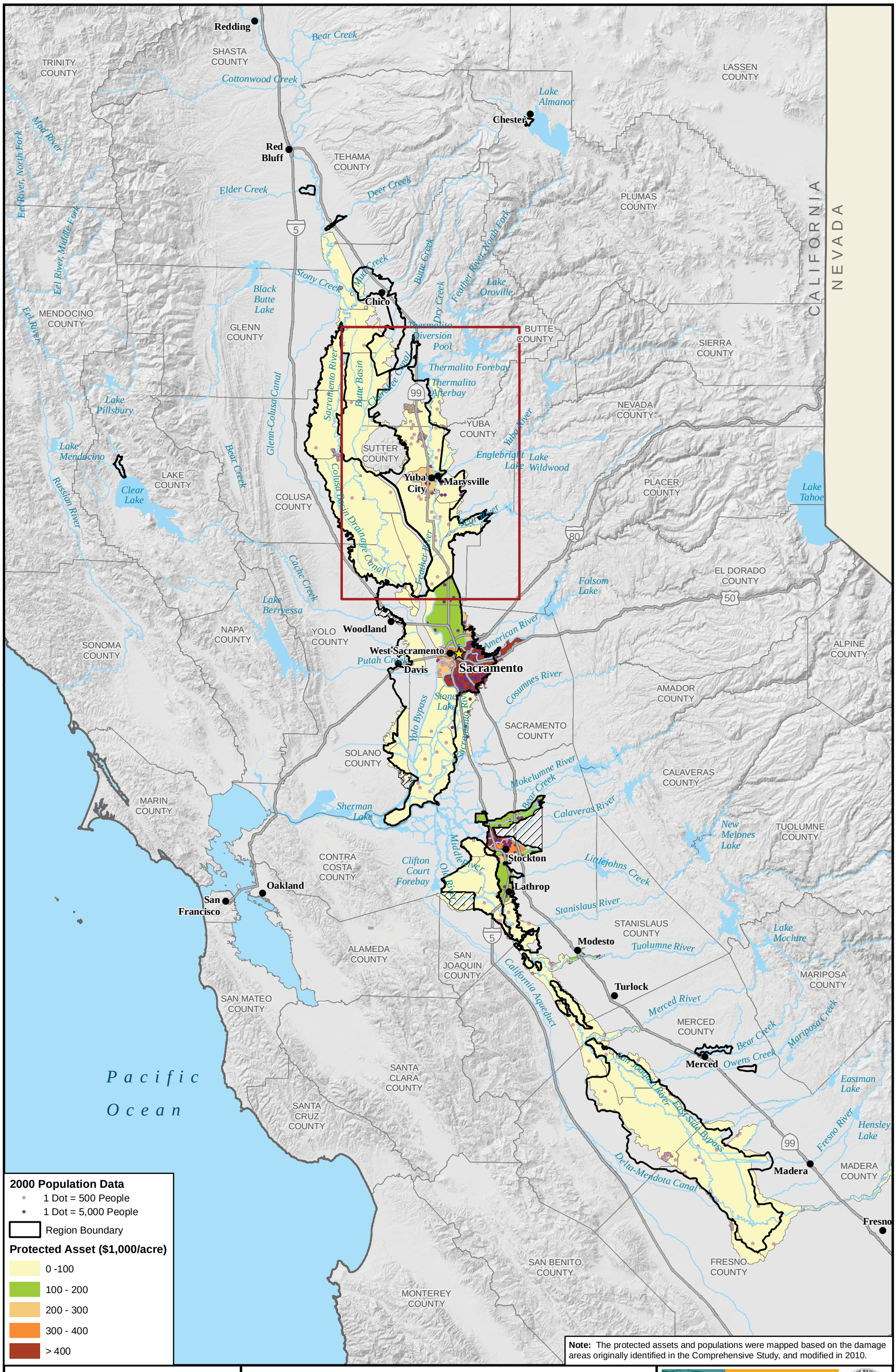
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map01_Overview.mxd
MAP 1

Map 2 – Protected Populations and Assets

Over the last century, the Central Valley has experienced intensive development to meet the needs of a growing population. A complex water supply and flood risk management system supports and protects a vibrant agricultural economy, several cities, and numerous small communities. The SPFC protects a population of over one million people, major freeways, railroads, airports, water supply systems, utilities, and other infrastructure of statewide importance, including $69 billion in assets (includes structural and content value and estimated annual crop production values). Many of the more than 500 species of native plants and wildlife found in the Central Valley rely, to some extent, on habitat existing within the SPFC.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Delta-Mendota Canal
Madera
MADERA COUNTY
Fresno
SAN BENITO COUNTY
FRESNO COUNTY
MONTEREY COUNTY
2000 Population Data
1 Dot = 500 People
1 Dot = 5,000 People
Region Boundary
Protected Asset ($1,000/acre)
0 -100
100 - 200
200 - 300
300 - 400
> 400
Note: The protected assets and populations were mapped based on the damage areas originally identified in the Comprehensive Study, and modified in 2010.
1 " = 20 miles
Miles
0 5 10 20
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Protected Populations and Assets
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FloodSAFE CALIFORNIA
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Prepared By: K. Miller
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File: Z:\Projects\109146\Map02_Assets.mxd
MAP 2

Map 3 – Levee Flood Protection Zones

Each flood planning region is composed of numerous Levee Flood Protection Zones (LFPZs). Assembly Bill No. 156 (AB156) defines a Levee Flood Protection Zone as the area that receives protection from a levee that is part of the facilities of the State Plan of Flood Control. AB 156 requires the development of the maps that delineate LFPZs using the best available existing information. The LFPZ are intended to show areas protected by project levees at or below design flow, but the LFPZs are not synonymous with a level of protection and should not be construed as such. The Department of Water Resources' Central Valley Floodplain Evaluation and Delineation Program published the initial LFPZs in December 2008.

The LFPZs are generally separated into two groups:

- LFPZ areas subject to flooding from ponding areas with depths greater than three feet. These areas are typically surrounded by levees, so the lateral extent of flooding can be identified. These areas are shown in orange on the published LFPZ maps.
- LFPZ areas subject to flooding from channel or overland flow resulting in unknown flood depths. These areas are not entirely surrounded by levees, so the LFPZ boundaries are thus approximate and should not be considered precise delineations. These areas are shown in yellow on the published LFPZ maps.

LFPZs estimate the maximum area that may be inundated if a project levee fails when the water surface elevation is at the top of a project levee. Zones depicted on this map were created utilizing methods and assumptions described in the LFPZ Map Development Technical Memorandum, and do not necessarily depict areas likely to be protected from flow events for which project levees were designed. The LFPZ Map Development Technical Memorandum was produced by DWR's Division of Flood Management, Floodplain Risk Management Branch.

Lands within the LFPZs may be subject to flooding due to various factors, including the failure or overtopping of project or non-project levees, flows that exceed the design capacity of project or non-project levees, and flows from water sources not specifically protected against by project levees. Lands not mapped within a LFPZ are not invulnerable to flood risk, and some may also experience flooding from these or other processes.

Feather River Flood Planning Region Flood History

The following flood history was compiled from the Yuba County Multi-Jurisdictional, Multi-Hazard Mitigation Plan, Sutter County Operational Area Emergency Operations Plan, Sutter County Multi Hazard Mitigation Plan, Historical Reference Document for the State Plan of Flood Control May 15, 2012, and information collected by the Statewide Flood Management Program. The list includes major events beginning in 1950, after substantial completion of flood control infrastructure. Specific information on localized flooding was included where available.

1950 Yuba River. Yuba River broke through the dredger tailings of the Yuba Goldfields in the vicinity of Hammonton, upstream of the SRFCP levees, and flooded large areas in the downstream project reaches. The communities of Hammonton, Linda, Olivehurst, and Arboga, and over 40,000 acres of agricultural land were inundated by the overflow. The peak flow in the Yuba River was approximately 107,000 cubic feet per second (cfs), approximately 40,000 cfs of which escaped through the Goldfields breach.

Damages occurred to residential property, commercial and industrial property, public utilities, and agricultural properties. No lives were lost, but about 8,000 people were evacuated from the area.

Nov. 19th break in Yankee Slough flooded Sutter County.

1955 Christmas Flood. A break in the levee on the Feather River south of Yuba City occurred at about midnight on December 23.. The initial surge of water spread westerly through Gilsizer Slough to the Sutter Bypass and northerly into Yuba City. Within less than 24 hours, the heart of Sutter County was flooded from the Feather River on the east and south to the Bypass on the west and southwest. To the north, the water spread north of Colusa Avenue (Highway 20) in several areas, including some west of Walton Avenue. Nearly 100,000 acres were flooded and resulted in 38 deaths, injuries to 3,200 people, and nearly $40 million in property damage. The bridge over the Feather River at 5th Street was washed out and telephone service was lost south of Colusa Avenue.

The cities of Linda, Olivehurst, Yuba City, and Marysville were evacuated.

1969 Winter 1969 Storms. Characterized by extremely large flows, including record flows at some locations. The Sacramento River Flood Control Project and other flood management programs had been implemented, and project levees, dams, reservoirs, and waterways were employed to control much of the flood flows through the Sacramento system. However, local flooding, mostly on agricultural lands, still occurred.

1983 Winter Storms. Flooding throughout entire Central Valley with numerous levee breaks and major damage.

1986 Winter Storms. Many seepage areas and boils developed along the Feather and Yuba River levees. As flood flows began to recede, the stress on the levee system resulted in a breach of the south levee of the Yuba River just upstream of Highway 70, near the confluence of the Feather and Yuba Rivers. The communities of Linda and Olivehurst were flooded.

Approximately 24,000 people were forced out of their homes in the Linda Olivehurst area; 200 who did not leave in time waited on roofs for rescue by boats and helicopters. About 7,000 acres of land were inundated because of the levee failure and over 4,000 homes and businesses were either damaged or destroyed.

Levee slumping in the Robbins area of Sutter County

1995 Severe Winter Storms. Floods were caused by two direct downpours which created major surface drainage back-ups at numerous locations throughout Sutter County. Most of the water simply was on the wrong side of the levees. The storms were accompanied by high winds which also contributed significantly to the damage. The two separate events occurred in January and March and resulted in more than $850,000 in damage to County facilities.

1997 January 1997 Floods. Dry Creek levee failure forced the evacuation of over 30,000 people and was considered one of the largest evacuation efforts in the State of California

The Feather River east levee failed at the west end of Country Club Road near the town of Arboga, California. Flooding occurred in Arboga, southwest Linda, Olivehurst and areas north of Bear River levee from Highway 70 to the southern end of Olivehurst.

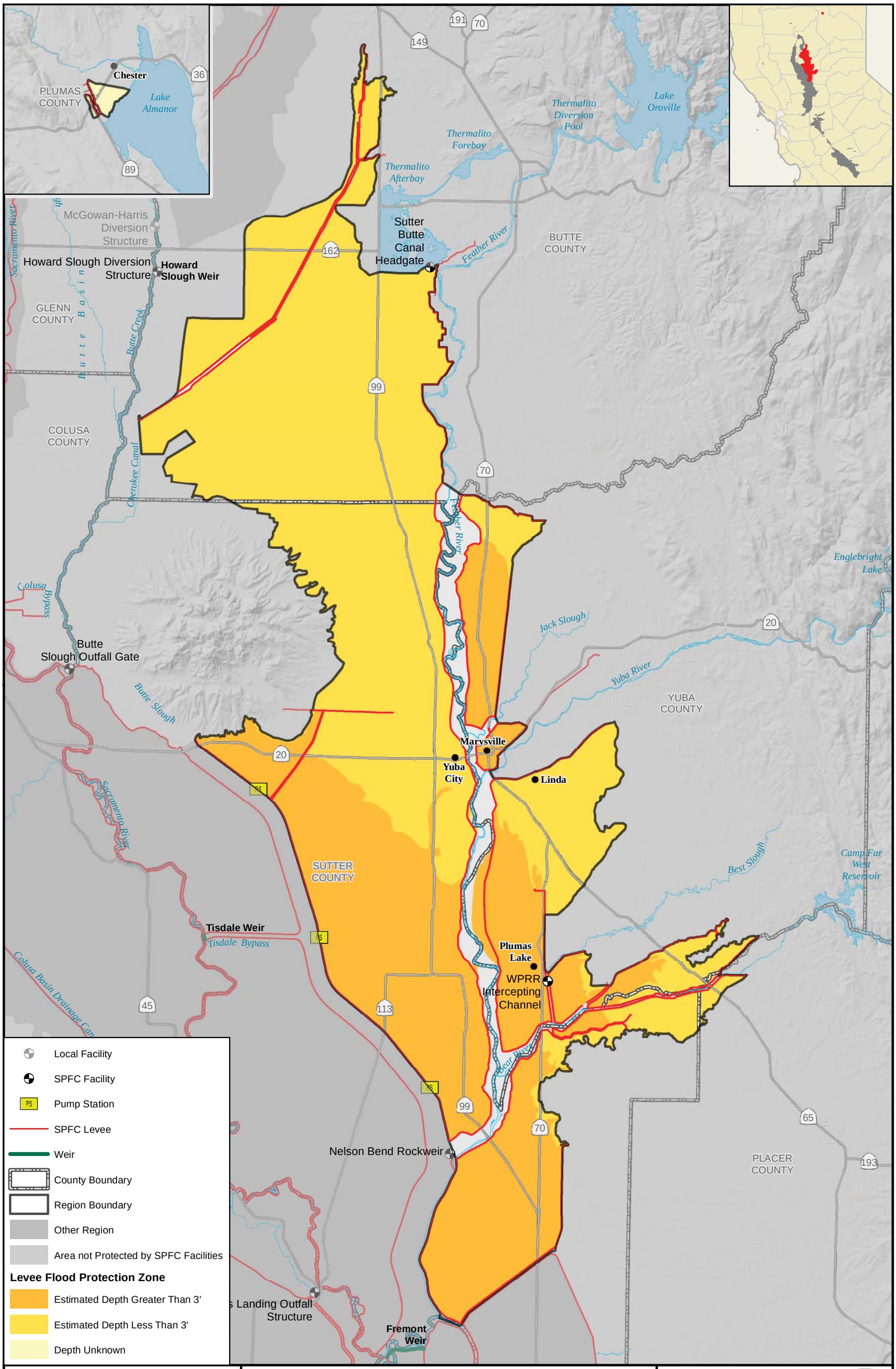
Flood waters reached a height that overtopped the north levee of the Bear River. High winds during this flood event resulted in significant wave damage to the Feather, Western Pacific Interceptor Canal, and Bear River levees.

1998 Flooding in the Sacramento Valley.

2005 December 31. A boil was discovered at the site of the 1997 Dry Creek levee failure. Boil was successfully contained and repaired by USACE.

2005-2006 Winter storm. 72,000 gallons of treated wastewater was discharged into the Bear River as a result of excessive rainfall

The 1955 Christmas Flood in Yuba City caused widespread damage


Chester
PLUMAS COUNTY
Lake Almanor
36
89
191
70
149
Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
McGowan-Harris Diversion Structure
Sacramento River
Howard Slough Diversion Structure
Howard Slough Weir
162
Sutter Butte Canal Headgate
Feather River
BUTTE COUNTY
GLENN COUNTY
Butte Basin
Butte Creek
99
COLUSA COUNTY
Cherokee Canal
Feather River
Englebright Lake
Colusa Bypass
Butte Slough Outfall Gate
Butte Slough
Jack Slough
20
Yuba River
YUBA COUNTY
Marysville
Yuba City
Linda
Sacramento River
SUTTER COUNTY
Best Slough
Camp Far West Reservoir
Tisdale Weir
Tisdale Bypass
Plumas Lake
WPRR Intercepting Channel
Colusa Basin Drainage Canal
45
113
Bear River
65
193
PLACER COUNTY
Nelson Bend Rockweir
Landing Outfall Structure
Fremont Weir
Local Facility
SPFC Facility
Pump Station
SPFC Levee
Weir
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Levee Flood Protection Zone
Estimated Depth Greater Than 3'
Estimated Depth Less Than 3'
Depth Unknown
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Levee Flood Protection Zones
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FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map03_LFP.mxd
MAP 3

Map 4 – Local Jurisdictions

The Local Jurisdictions Map provides the boundaries for cities, counties, and tribes located within or near the flood management planning region. These entities may provide services related to flood management planning such as: land use regulation and planning, public works engineering and maintenance, and emergency services.

The Feather River Region crosses four counties and six cities: Butte County, Placer County, Sutter County, Yuba County, the City of Biggs, the City of Gridley, the City of Live Oak, the City of Marysville, the City of Wheatland and Yuba City. The incorporated city and county boundaries illustrated on the map were obtained from CALFIRE 2010 (http://www.fire.ca.gov). For more details on the flood management planning boundary, please refer to Map 3 and text.

Joint Power Authorities, such as those formed in the Sacramento and San Joaquin river basins in a response to floods in the 1980s and 1990s, facilitate the cooperation of local agencies for flood management in urban areas. The Sutter Butte Flood Control Agency (SBFCA) and Three Rivers Levee Improvement Authority (TRLIA) are incorporated in the Feather River Flood Planning Region.

Contact information for these entities can be found in the Directory of Flood Officials published by DWR in September 2011.

Disadvantaged Communities (DAC)

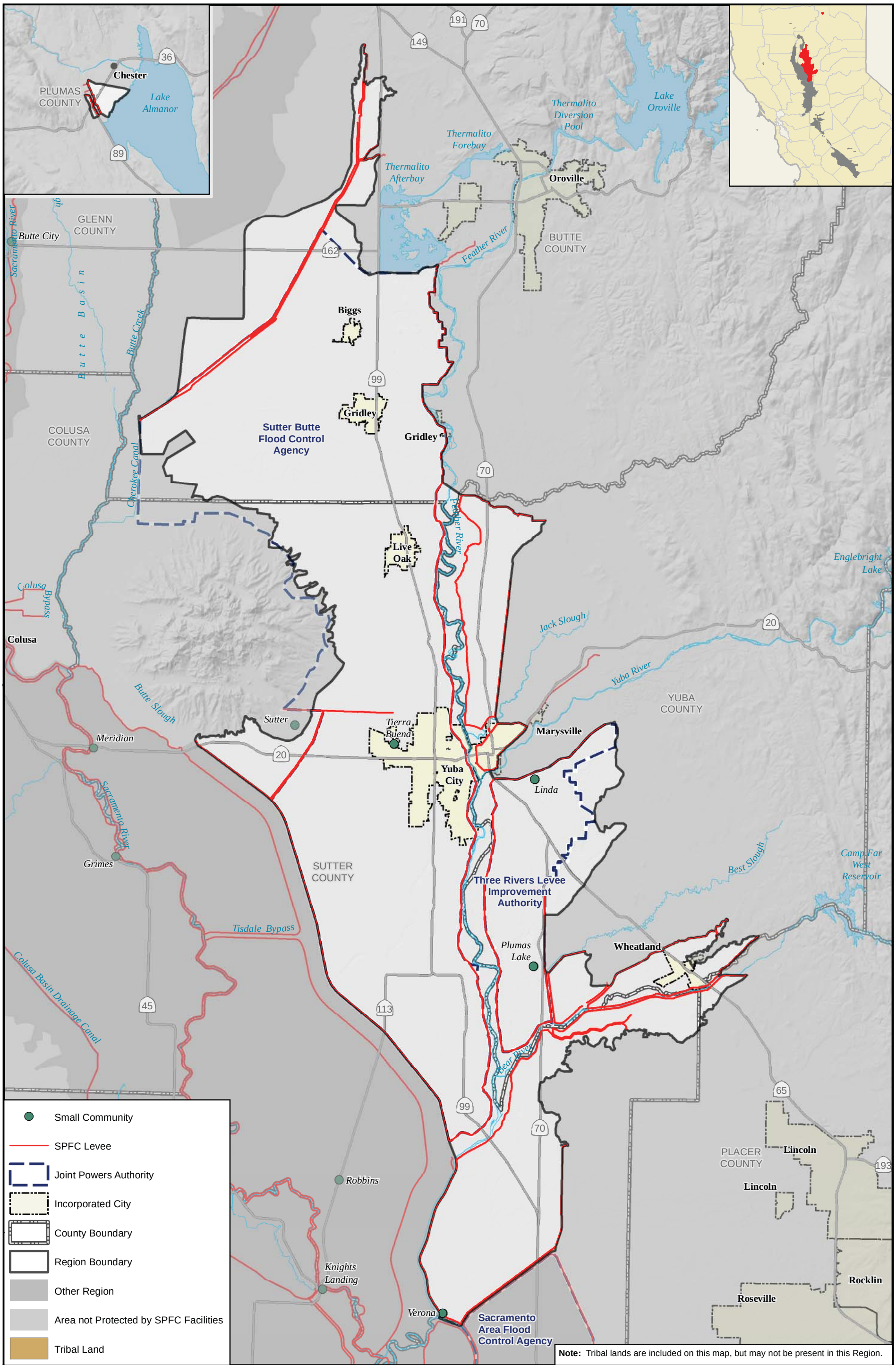
DWR recognizes that disadvantaged communities (DAC) may exist within each region. DACs may be eligible for grants or additional State financial assistance for local flood control efforts. DAC status can be confirmed using the Department of Water Resources, Disadvantaged Community Mapping Tool:

http://www.water.ca.gov/irwm/integregio_resourceslinks.cfm#DAC

Tribal Land Boundaries

The locations of Tribal Land boundaries from the Bureau of Indian Affairs (BIA) were used to determine if tribal lands exist within the Region. Very few of the identified Tribal Lands are located in or adjacent to the Flood Management Regional Areas. Where present, the Tribal names are provided. No tribal lands were identified in this region. http://www.bia.gov

Aerial photograph of the Yuba-Feather Confluence, 2005


Chester
PLUMAS COUNTY
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Lake Oroville
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Thermalito Afterbay
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Butte Creek
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Cherokee Canal
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Englebright Lake
Colusa Bypass
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Yuba River
YUBA COUNTY
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Sutter
Tierra Buena
Marysville
Meridian
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Yuba City
Linda
Sacramento River
Grimes
SUTTER COUNTY
Three Rivers Levee Improvement Authority
Best Slough
Camp Far West Reservoir
Tisdale Bypass
Plumas Lake
Wheatland
Colusa Basin Drainage Canal
45
113
Bear River
65
PLACER COUNTY
Lincoln
193
Robbins
Knights Landing
Verona
Sacramento Area Flood Control Agency
Roseville
Rocklin
Small Community
SPFC Levee
Joint Powers Authority
Incorporated City
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Tribal Land
Note: Tribal lands are included on this map, but may not be present in this Region.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Local Jurisdictions
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FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map04_Jurisdictions.mxd
MAP 4

Map 5 – DWR Integrated Regional Water Management Planning Areas

Integrated Regional Water Management (IRWM) incorporates the physical, environmental, societal, economic, legal, and jurisdictional aspects of water management into regional solutions through a collaborative stakeholder process to promote sustainable water use. IRWM improves water management and helps ensure economic stability, environmental stewardship, public safety and other benefits.

Flood management is a critical component to IRWM. As part of the Regional Flood Management Planning Effort, flood management strategies will be developed for the Flood Management Regions as part of the Regional Plan, and integrated into the IRWM Plans that coincide with the Regional Plan Area. Coordination between Regional Flood Management Planning and the overlying IRWM Planning Areas is encouraged.

Consideration on how efforts by Flood Management Planning will be integrated with ongoing IRWM planning and implementation activities being conducted by IRWM Regional Water Management Groups (RWMGs) will be necessary for assessing and comprehensively addressing water supply, water quality, flood, and ecosystem challenges.

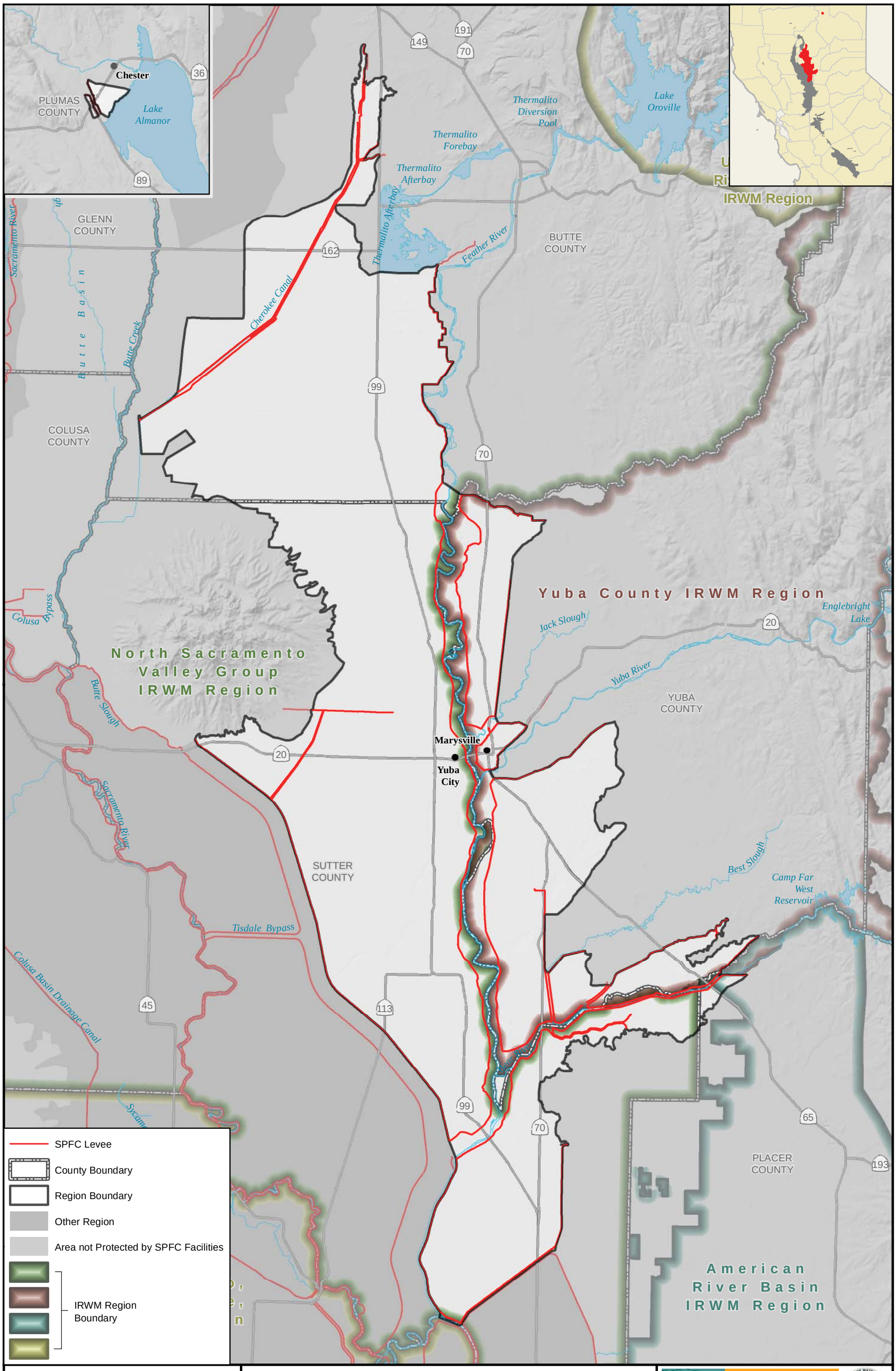
Within the Feather River Flood Management Planning Region, the IRWM RWMGs that have been established and are undertaking regional planning and implementation efforts are Northern Sacramento Valley Four County Group and Yuba County.

Over the past decade, California has improved its understanding of the value of regional planning and made significant steps in implementing IRWM. Recognizing the current efforts of the IRWM RWMGs and closely coordinating the approach for development of regional flood management plans will be critical for promoting and establishing a regional planning and implementation framework to achieve the goals of water supply reliability and reducing flood risks.

An example of integrated storm water management

Contact Information

IRWM Regions	Agency	Contact	Email	Phone	Agency Website
Northern Sacramento Valley Four County Group	Butte County Water and Resource Conservation	Vickie Newlin	vnewlin@buttecounty.net	(530) 538-2179	http://buttecounty.net/Water%20and%20Resource%20Conservation
Yuba County	Yuba County Water Agency	Scott Matyac	smatyac@ycwa.com	(530) 741-6278 x117	http://www.ycwa.com/projects/detail/7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COLUSA COUNTY
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Yuba County IRWM Region
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Jack Slough
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North Sacramento Valley Group IRWM Region
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Marysville
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Best Slough
Camp Far West Reservoir
SUTTER COUNTY
Tisdale Bypass
Colusa Basin Drainage Canal
45
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65
PLACER COUNTY
193
American River Basin IRWM Region
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
IRWM Region Boundary
1 " = 4 miles
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Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
DWR Integrated Regional Water Management
Planning Areas
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FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map05_IRWMs.mxd
MAP 5

Map 6 – General Land Use

This map presents recent general land use based on the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) Land Use Data. The following FMMP land use surveys were used to represent the land use conditions in the Feather River Region:

- Butte (2010), Sutter (2010), and Yuba (2010) Counties

Land use is described by the following categories:

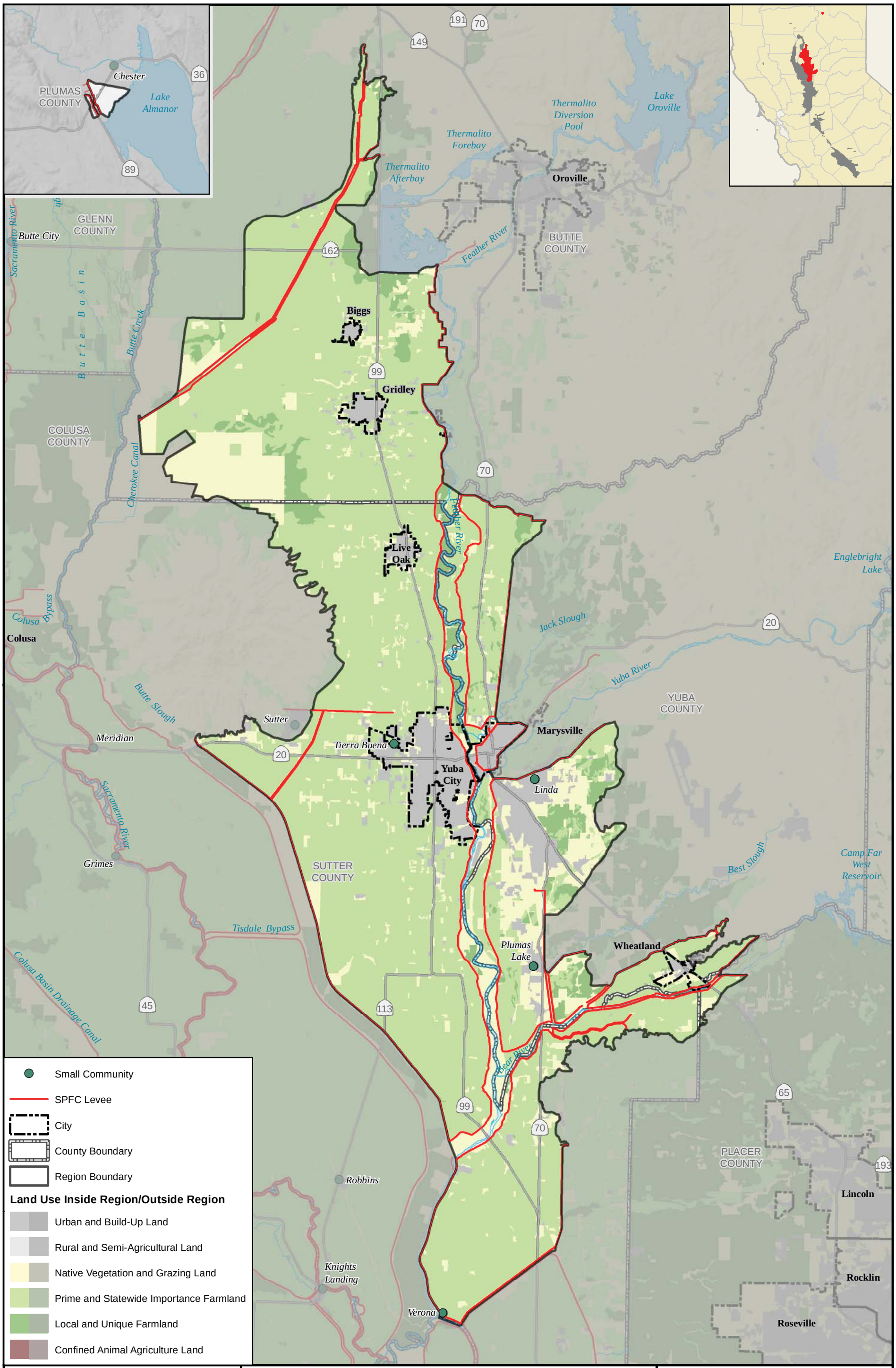
- Urban and Build-Up Lands – Urban and Built-Up land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures.
- Rural and Semi-Agricultural Lands – This includes residential areas of one to five structures per ten acres. This includes semi-agricultural lands such as farmsteads, agricultural storage and packing sheds, unpaved parking areas, composting facilities, equine facilities, firewood lots, and campgrounds.
- Native Vegetation and Grazing Land –
  - » Land on which the existing vegetation is suited to the grazing of livestock. This category is used only in California and was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.
  - » Land which does not meet the criteria of any other category. Typical uses include low density rural development, heavily forested land, mined land, or government land with restrictions on use. This category was subdivided into: Rural Residential Land (R), Vacant or Disturbed Land, Confined Animal Agriculture, and Nonagricultural and Natural Vegetation beginning with the 2004 data. Subsequently, R was subdivided into: Semi-Agricultural and Rural Commercial Land and Rural Residential Land beginning with the 2006 data.
  - » Land which consists of open field areas that do not qualify for an agricultural category, mineral and oil extraction areas, and rural freeway interchanges.
- Prime and Statewide Importance Farmland –
  - » Prime Farmland - Irrigated land with the best combination of physical and chemical features able to sustain long term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the four years prior to the mapping date.
  - » Farmland of Statewide Importance - Irrigated land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops. This land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. Land must have been used for production of irrigated crops at some time during the four years prior to the mapping date.
- Local and Unique Farmland –
  - » Farmland of Local Importance - All farmable lands that do not meet the definitions of Prime, Statewide, or Unique. This includes land that is or has been used for irrigated pasture, dryland farming, confined livestock and dairy, poultry facilities, aquaculture and grazing land.
  - » Unique Farmland - Lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
  - » Confined Animal Agriculture Land - This includes aquaculture, dairies, feedlots, and poultry facilities. Confined Animal Agriculture qualifies for Farmland of Local Importance in some counties.

The Feather River region consists of mostly agricultural land designated as "Prime and Statewide Importance Farmland" with areas of "Local and Unique Farmland" and "Native vegetation and grazing land."

Yuba City, Marysville, Live Oak, Gridley and Biggs are the urban or small communities within the region.

Land Type Category	Acres of Land Type	Total % of Region
Urban and Build-Up Land	23,530	8%
Native Vegetation and Grazing Land	50,080	16%
Local and Unique Farmland	15,140	5%
Prime and Statewide Importance Farmland	213,660	71%
Confined Animal Agricultural Land	0	0%
Rural and Semi-Agricultural Land	0	0%
Total	**302,410**	**100%**

Agriculture is a predominant land use in the Feather River Region


Chester
PLUMAS COUNTY
Lake Almanor
36
89
191
70
149
Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
Oroville
Feather River
BUTTE COUNTY
GLENN COUNTY
Butte City
Sacramento River
Butte Basin
Butte Creek
162
Biggs
99
Gridley
COLUSA COUNTY
Cherokee Canal
Live Oak
Feather River
Englebright Lake
Colusa Bypass
Colusa
Jack Slough
20
Yuba River
YUBA COUNTY
Butte Slough
Sutter
Meridian
Tierra Buena
Marysville
Yuba City
Linda
Sacramento River
Grimes
SUTTER COUNTY
Best Slough
Camp Far West Reservoir
Tisdale Bypass
Plumas Lake
Wheatland
Colusa Basin Drainage Canal
45
113
Bear River
65
PLACER COUNTY
193
Lincoln
Robbins
Knights Landing
Verona
Rocklin
Roseville
Small Community
SPFC Levee
City
County Boundary
Region Boundary
Land Use Inside Region/Outside Region
Urban and Build-Up Land
Rural and Semi-Agricultural Land
Native Vegetation and Grazing Land
Prime and Statewide Importance Farmland
Local and Unique Farmland
Confined Animal Agriculture Land
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
General Land Use
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DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map06_LandUse.mxd
MAP 6

Map 7 – Local Maintaining Agencies

This map illustrates the various maintaining agencies within the Feather River Flood Management Planning Region. Maintaining agencies may be any city, county, district or other political subdivision of the State that is authorized to maintain levees. The California Department of Water Resources (DWR) maintains levees pursuant to California Water Code (CWC) Sections 8361 and 12878, and in that capacity is considered a maintaining agency. Inspection reports on the conditions of levees and/or other facilities such as channels, structures, and pump stations are briefly described below.

Local Maintaining Agency Annual Report for Levees of the State Plan of Flood Control – California Water Code Sections 9140-9141

DWR prepares the Local Maintaining Agency (LMA) Annual Report annually for the Central Valley Flood Protection Board (CVFPB) to meet the requirements of California Water Code (CWC) Section 9141.

LMAs submit specific information to DWR by September 30 of each year regarding the levees they operate and maintain. According to CWC Section 9140, the information submitted to DWR shall include all of the following five items:

1. Information known to the LMA that is relevant to the condition or performance of the Project Levee
2. Information identifying known conditions that might impair or compromise the level of flood protection provided by the Project Levee
3. A summary of the maintenance performed by the LMA during the previous fiscal year
4. A statement of work and estimated cost for operation and maintenance of the Project Levee for the current fiscal year, as approved by the LMA
5. Any other readily available information contained in the records of the LMA relevant to the condition or performance of the Project Levee, as determined by the CVFPB or DWR

DWR summarizes the information in a report format and provides the report to the CVFPB by December 31 of each year. Submission of information by LMA includes levee conditions and operation and maintenance activities which are essential for a comprehensive understanding of the flood protection system in the Central Valley. The information presented in this report is also critical to flood control system evaluation and assessment. The reporting status of each LMA for 2012 is presented on the table below.

2012 Inspection Report of the Central Valley State-Federal Flood Protection System

Federal Flood Control Regulations (Title 33 of the Code of Federal Regulations, Section 208.10 (33 CFR 208.10)) require that federal flood protection facilities be inspected at least four times a year — immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. In addition, inspections at intermediate times may be necessary. These periodic inspections are specifically needed to ensure that maintenance measures for project facilities are being effectively carried out, not to determine other inherent problems (geotechnical, flow capacity, etc.) with the project facilities.

The 2011 Inspection Report of the Central Valley State-federal Flood Control System is the annual report on the effectiveness of facility maintenance activities of the maintaining agencies. The report is based primarily on DWR's inspections conducted during the summer and fall of 2011. The overall ratings (see table below) are included for each of the LMAs within the Feather River Region based on the one of three possible ratings based on the state of its levees:

- Acceptable (A) – No immediate work required, other than routine maintenance. The flood protection project will function as designed and intended with a high degree of reliability, and necessary cyclic maintenance is being performed adequately.
- Minimally Acceptable (M) – One or more deficient conditions exist in the flood protection project that needs to be improved or corrected. However, the project will essentially function as designed with a lesser degree of reliability than what the project could provide.
- Unacceptable (U) – One or more deficient conditions exist that may prevent the project from functioning as designed, intended, or required.

USACE Inspections

USACE conducts inspections to determine whether federal and nonfederal flood protection facilities meet federal maintenance requirements. This determination has a major bearing on eligibility for USACE's rehabilitation assistance under Public Law 84-99. There are two types of regular inspections conducted by USACE: routine inspections and periodic inspections. Routine inspections are visual inspections conducted annually to verify that the levee system is being properly operated and maintained. Periodic inspections include a more detailed, comprehensive, and consistent evaluation of the condition of the levee system and are conducted every 5 years by a multidisciplinary team.

SPFC Maintaining Agencies	LMA 2012 Annual Reporting				
Agency Name	Part 1	Part 2	Part 3	Part 4	Part 5
Levee District No. 1, Sutter County	✔	✔	✔	✔	✔
Levee District No. 9, Sutter County	✔	✔	✔	✔	✔
Reclamation District No. 10, Honcut	✔	✔	✔	✔	No
Reclamation District No. 784, Plumas Lake	✔	✔	✔	✔	✔
Reclamation District No. 817, Carlin	✔	✔	✔	✔	No
Reclamation District No. 1001, Nicolaus	✔	✔	✔	✔	✔
Reclamation District No. 2103, Wheatland Vicinity	✔	✔	✔	✔	✔
Marysville Levee Commission, NA 4	✔	✔	✔	✔	✔
Plumas County Department of Public Works, NA 15	✔	No	✔	✔	No
DWR Sutter Maintenance Yard, Maintenance Area 3	✔	No	✔	✔	No
DWR Sutter Maintenance Yard, Maintenance Area 7	✔	No	✔	✔	No
DWR Sutter Maintenance Yard, Maintenance Area 13	✔	No	✔	✔	✔
DWR Sutter Maintenance Yard, Maintenance Area 16	✔	No	✔	✔	✔
DWR Sutter Maintenance Yard (Statutory)					

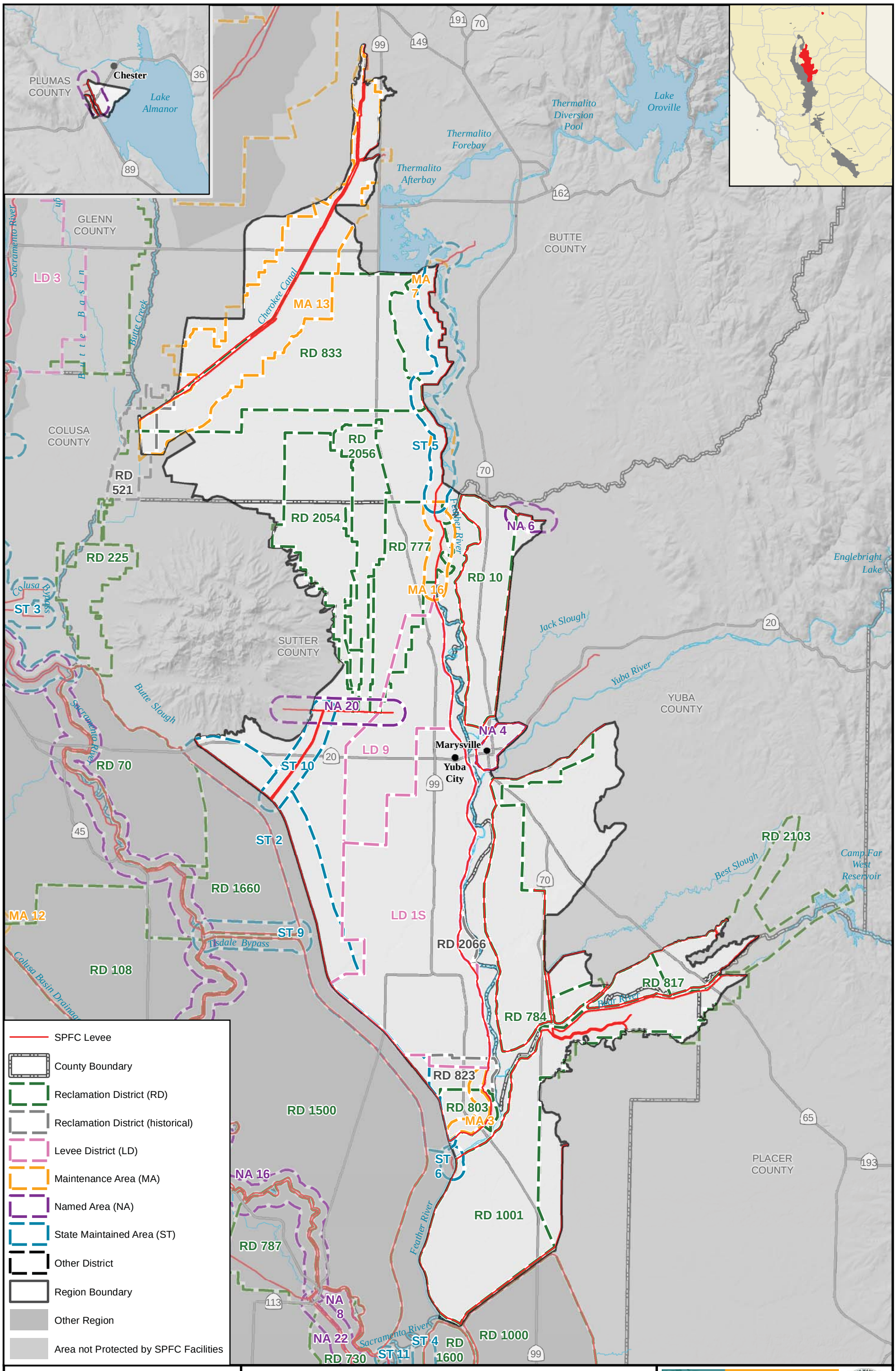
*Overall unit threshold percentage is less than 10.00%, however, U rated miles are present, so the overall unit rating is M instead of A.

[1] The number of channels/structures/pumping plants is presented as (number of structures) followed by rating.

Other Non-SPFC Maintaining Agencies within the Region are listed below:

- Reclamation District No. 777, Butte County B118
- Reclamation District No. 833, Gridley
- Reclamation District No. 2054, Sutter
- Reclamation District No. 2056, Kramer District

Contact information for the Local Maintaining Agencies can be found in *Directory of Flood Control Officials* published by DWR in September 2011. Detailed information, such as facility modification history, Operations and Maintenance Manuals used and financial data, for local agencies that maintain SPFC facilities can be found in the *Operations & Maintenance Roles and Responsibilities Technical Memorandum* published by DWR in April 2012.


PLUMAS COUNTY
Chester
Lake Almanor
36
89
99
149
191
70
Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
162
GLENN COUNTY
BUTTE COUNTY
Sacramento River
LD 3
Butte Basin
Butte Creek
Cherokee Canal
MA 13
MA 7
RD 833
COLUSA COUNTY
RD 521
RD 2056
ST 5
RD 2054
RD 777
Feather River
NA 6
RD 225
RD 10
MA 16
Colusa Bypass
ST 3
Englebright Lake
Jack Slough
20
SUTTER COUNTY
Yuba River
YUBA COUNTY
Butte Slough
NA 20
NA 4
Marysville
Yuba City
LD 9
ST 10
RD 70
45
ST 2
RD 2103
Best Slough
Camp Far West Reservoir
RD 1660
MA 12
LD 1S
ST 9
Tisdale Bypass
RD 2066
RD 108
RD 817
Bear River
RD 784
Colusa Basin Drainage
RD 823
RD 803
MA 3
RD 1500
65
PLACER COUNTY
193
ST 6
NA 16
RD 1001
RD 787
113
NA 8
NA 22
RD 730
ST 11
ST 4
RD 1600
RD 1000
SPFC Levee
County Boundary
Reclamation District (RD)
Reclamation District (historical)
Levee District (LD)
Maintenance Area (MA)
Named Area (NA)
State Maintained Area (ST)
Other District
Region Boundary
Other Region
Area not Protected by SPFC Facilities
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Local Maintaining Agencies
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DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map07_LMAs.mxd
MAP 7

Map 8 – Existing Critical Facilities and Economic Assets

Protected assets and their locations often determine the capability of a Region and its special districts ability to respond to emergencies. The location of these protected assets can also impact the potential losses when a disaster occurs. An inventory of the protected assets is shown on this map.

Feather River Flood Planning Region

Over the last century, the Central Valley has experienced intensive development to meet the needs of a growing population. A complex flood risk management system supports and protects a vibrant agricultural economy, several cities and numerous smaller communities and associated infrastructure. The current SPFC flood control system throughout the Central Valley protects a population of over one-million people and billions of dollars worth of assets that are currently located within flood plains, including major freeways, railroads, airports, water supply systems, utilities, and other public and private infrastructure of significant regional and statewide importance.

The Feather River Flood Planning Region is rich in these existing assets that are potentially at risk should a flood emergency occur. The Feather River Flood Management Planning Region consists of predominantly agricultural rural land, but also contains several cities and smaller communities such as Yuba City and Marysville, Live Oak, Gridley, Olivehurst, Linda and Wheatland. The Town of Chester is also included in the Feather River Flood Planning Region.

The Existing Critical Facilities and Economic Assets map indicates existing critical facilities and regional assets identified within the Planning Region, located from various available maps and GIS sources. It is not a complete inventory of all valuable regional assets and facilities, nor is it intended to be. The following list of potential Regional at-risk assets identifies common types of typical assets that may exist, and should be considered, within the Flood Planning Region.

Potential Regional At-Risk Assets

State and Federal Facilities

- State and Federal Highways / Bridges
- Courthouses
- Post Offices
- Prisons
- Military Facilities
- Water Infrastructure
- Canals
- SPFC Levees

Local / County Facilities

- Jails and Detention Centers
- Government Buildings
- Roadways / Bridges
- Transit Centers
- Water / Wastewater facilities
- Airports
- Reservoirs / Aqueducts
- Parks / Zoos
- Local Non-Project Levees

Health and Public Safety

- Hospitals
- Convalescent Facilities
- Medical Facilities / Clinics
- Police
- Fire
- Highway Patrol

Education

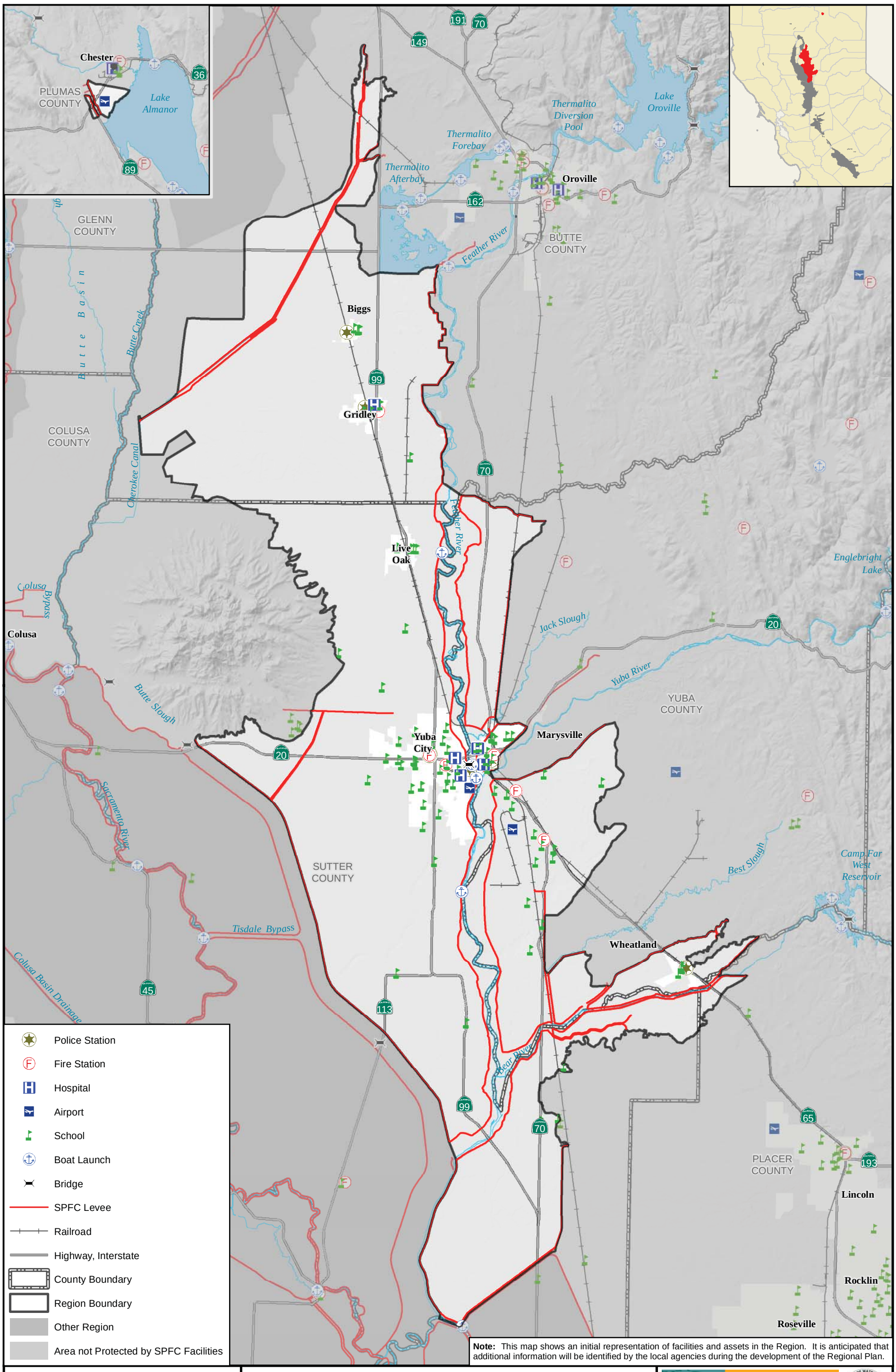
- Public Schools
- Libraries
- Colleges / Universities

Other Critical Public Assets / Infrastructure

- Bus Terminals
- Railroad Stations
- Railroad Tracks / Yards
- Power Facilities / Substations
- High Voltage Transmission Facilities
- Pipelines
- Stadiums / Arenas / Entertainment Venues
- Regional Shopping Malls
- Hazmat Storage Areas
- Docks / Harbors / Launching Facilities

Note: This map shows an initial representation of facilities and assets in the Region. It is anticipated that additional information will be identified by the local agencies during the development of the Regional Plan.

Various regional assets located at the confluence of the Yuba and the Feather Rivers


Chester
PLUMAS COUNTY
Lake Almanor
Thermalito Forebay
Thermalito Afterbay
Thermalito Diversion Pool
Lake Oroville
Oroville
GLENN COUNTY
BUTTE COUNTY
Feather River
Butte Basin
Butte Creek
Biggs
Gridley
COLUSA COUNTY
Cherokee Canal
Live Oak
Colusa Bypass
Colusa
Butte Slough
Sacramento River
Tisdale Bypass
Colusa Basin Drainage
Jack Slough
Yuba River
YUBA COUNTY
Yuba City
Marysville
SUTTER COUNTY
Best Slough
Englebright Lake
Camp Far West Reservoir
Wheatland
Bear River
PLACER COUNTY
Lincoln
Rocklin
Roseville
191
70
149
162
99
20
45
113
65
193
36
89
Police Station
Fire Station
Hospital
Airport
School
Boat Launch
Bridge
SPFC Levee
Railroad
Highway, Interstate
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: This map shows an initial representation of facilities and assets in the Region. It is anticipated that additional information will be identified by the local agencies during the development of the Regional Plan.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Existing Critical Facilities and Economic Assets
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DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map08_ExistingAssets.mxd
MAP 8

Map 9 – SPFC and Local Flood Control Facilities

The Feather River, a tributary to the Sacramento River, drains a major watershed in the Sierra Nevada and Cascade Mountains. The Feather River Flood Management Planning Region contains a number of flood control facilities both locally owned and operated as well as State owned and operated through the State Plan of Flood Control (SPFC). The main purpose of these facilities is to control storm water runoff and protect the local population in the region from flood risks. The SPFC facilities also serve the purposes of creating hydroelectric power and managing and conveying the State's potable water supply. SPFC facilities in the region are listed and briefly explained below. Information on local flood control facilities may be provided by local entities during the regional flood management planning process.

Lake Almanor North Fork Feather River Diversion Structure and Diversion Channel – Located between the North Fork Feather River and Lake Almanor, this diversion structure and channel act to redirect water from the North Fork Feather River when the river is flowing at high water levels. The diversion channel provides temporary storage for some of the floodwater as it travels to Lake Almanor. Water exiting the diversion channel enters the lake at a different point than the North Fork Feather River, preventing inundation at a single entry point.

Sutter Butte Canal Headgate – Located at the exit point of the Thermalito Reservoir, the head gate acts as a floodgate to control the release and flow of water from the reservoir into the Feather River. Water travels to the head gate from upstream where it is released from Lake Oroville. The picture below depicts how a head gate works, as the individual sections can be opened and closed in order to allow a small or large amount of water to pass through.

WPRR Intercepting Channel – Located along the Bear River, this man-made channel catches storm water runoff and guides the water from open farmland south to the Bear River. This channel prevents flooding through the collection of storm water and its conveyance to a body which can contain the flows.

Cherokee Canal – Located East of Butte Creek and north of the Sutter Buttes, this man-made waterway connects waters from the north of Thermalito Reservoir to Butte Creek. This canal also can act as an aqueduct supplying water to the local community for agricultural irrigation. Currently, DWR Flood Maintenance Office is working on Phase 1 of a Cherokee Canal Corridor Management Strategy Pilot Project. This phase will involve sediment removal from Cherokee Canal.

Sutter Bypass – Located along the western edge of Sutter County, the bypass conveys water from just south of the Sutter Buttes to the Fremont Weir. This bypass is a leveed channel of the regional flood control system and conveys water from the Tisdale Weir to the Yolo Bypass and Sacramento River.

Sutter Bypass Pump Stations – Three Pump Stations are located along the Sutter Bypass. Specifically, one is located west of the Tisdale Weir, one on the northerly end of the bypass, and one on the southerly ends of the bypass. A pump station is used to supply water to the canal and drain low lying land. Water can be led into and out of the bypass by pumping. Water is pumped into the bypass during flood season and pumped out of the bypass for irrigation during the dry season.

Nelson Bend Rockweir – Located at the intersection of the Sutter Bypass and Feather River, this rockweir controls the hydraulic energy of flowing water from the river into the bypass. Acting as a barrier across the river, the weir is designed to alter the flow characteristics of the water. Water pools behind the weir and is released slowly once the water level has risen to the top of the barrier. Altering the hydraulic energy of the flowing water can prevent damage to the flood control system downstream.

Butte Slough Outfall Gate – Located near the intersection of Butte Creek and the Sacramento River, the outfall gate controls the flow of storm water from Butte Slough into the Sacramento River. Gates act as a flood control device as they can be opened and closed to allow a small or large amount of water to pass through. Flow rates exiting the gates are watched and monitored for effects on both whitewater sporting activities and fish habitat. In dry months, the gates are also used to allow water into the Sacramento River for agricultural irrigation.

Tisdale Weir – Located between the Yolo Bypass and the Sacramento River, this structure controls the hydraulic energy of flowing water from the river into the bypass. Acting as a barrier for water within the bypass, the weir is designed to alter the flow characteristics of the water. Water pools behind the weir and is released slowly once the water level has risen to the top of the barrier. Altering the hydraulic energy of the flowing water can prevent damage to the flood control system downstream. The weir is a low point where water can escape the river. This reduces the pressure on river levees downstream.

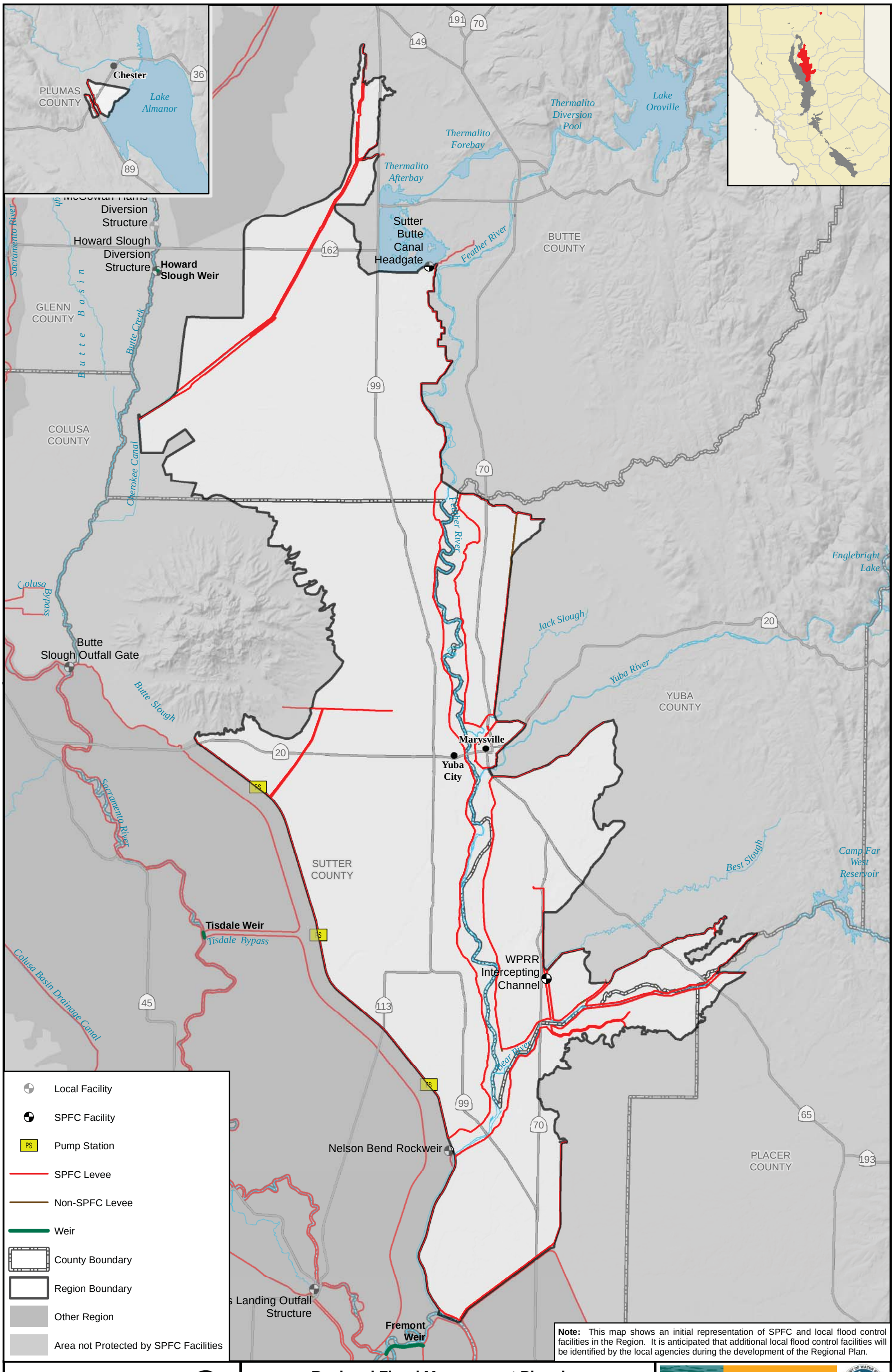
Fremont Weir – Located just south of Knights Landing Outfall Structure at the junction of the Sacramento River and the joint Feather River/Sutter Bypass channel, the Fremont Weir controls the hydraulic energy of flowing water from the Sacramento River, Sutter Bypass, and Feather River as it enters into the Yolo Bypass. Acting as a barrier for water within the bypass, the weir is designed to alter the flow characteristics of the water as it passes over the weir. Water pools behind the weir and is released slowly once the water level has risen to the top of the barrier. Altering the hydraulic energy of the flowing water can prevent damage to the flood control system downstream.

Knights Landing Outfall Structure – Located at the intersection of the Sacramento River and Sycamore Slough, this outfall structure consists of gates which control the amount of water which enters the main drainage channel of Colusa Basin from the Sacramento River. They are sometimes called Sycamore Slough Outfall Gates. The outfall structure consists of a concrete slab foundation having a long center section with abutments and wing walls on each side. The abutments close and open to let a smaller or larger amount of water through. The gates protect the lower Colusa Drainage Basin from backwater of the Sacramento River. The gates also assist with agricultural irrigation during the dry season.

McGowan-Harris Diversion Structure – Located along Butte Creek, this diversion structure acts to redirect water from Butte Creek for use in agricultural irrigation. This structure is not part of the SPFC but works in conjunction with SPFC facility Howard Slough Diversion Structure.

Howard Slough Diversion Structure – Located between Butte Creek and Howard Slough, this diversion structure acts to redirect water from Butte Creek. Diversion structures are typically used to divert water from an existing natural watercourse into a water supply conveyance system. These structures can include a weir, sluiceway, intake, or fishway. This diversion structure works in conjunction with the McGowan-Harris Diversion Structure. The two structures are used for irrigation of agricultural land and have no flood management role. There are plans to replace this old structure with a new structure.

Oroville Dam Spillway


Chester
PLUMAS COUNTY
Lake Almanor
36
89
191
70
149
Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
Diversion Structure
Howard Slough Diversion Structure
Howard Slough Weir
Sacramento River
Butte Basin
Butte Creek
GLENN COUNTY
162
Sutter Butte Canal Headgate
Feather River
BUTTE COUNTY
99
COLUSA COUNTY
Cherokee Canal
Colusa Bypass
Butte Slough Outfall Gate
Butte Slough
20
Marysville
Yuba City
Sacramento River
SUTTER COUNTY
Jack Slough
Yuba River
YUBA COUNTY
Englebright Lake
Camp Far West Reservoir
Best Slough
Tisdale Weir
Tisdale Bypass
Colusa Basin Drainage Canal
45
113
WPRR Intercepting Channel
Bear River
65
PLACER COUNTY
193
Nelson Bend Rockweir
Fremont Weir
Local Facility
SPFC Facility
Pump Station
SPFC Levee
Non-SPFC Levee
Weir
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: This map shows an initial representation of SPFC and local flood control facilities in the Region. It is anticipated that additional local flood control facilities will be identified by the local agencies during the development of the Regional Plan.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
SPFC and Local Flood Control Facilities
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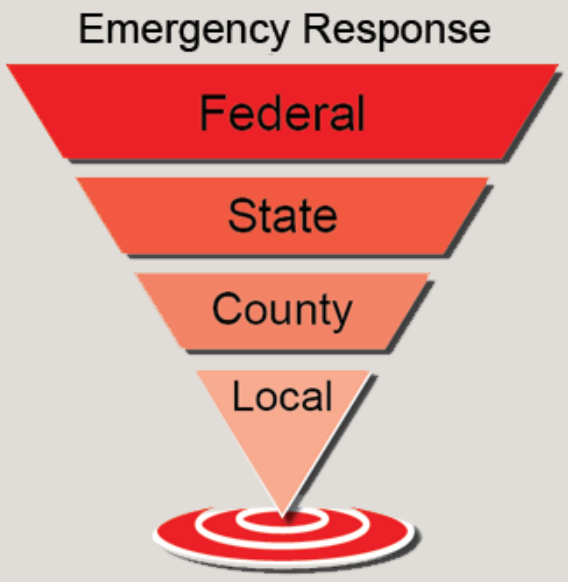
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map09_SPFCLocalFloodCtrl.mxd
MAP 9

Map 10 – Flood Emergency Response Facilities

Critical Emergency Response facilities and their locations often determine the capability of a region and its special districts ability to respond to emergencies. The location of these critical facilities can also impact the potential losses when a disaster occurs. An inventory of the critical emergency response facilities is shown on this map. (FloodER red triangle graphic is shown here)

As set forth in the California Government Code, the California Public Contract, the California Water Code, and the State Emergency Plan, the Department of Water Resources is the lead State agency for responding to flood emergencies; however every emergency begins at the local level and timely coordination of response efforts is critical to saving lives, property, and the environment. Emergency response planning provides a guide to Local Maintaining Agencies (LMA), Operational Areas (OA), and Department of Water Resources (DWR) for addressing flood threats as quickly as possible using the Standardized Emergency Management System (SEMS) and the Incident Command System (ICS). It is vital that local and county agencies follow SEMS and ICS protocols for addressing threats at the local level and have complete up-to-date emergency action plans that:

- Streamline communications (contact information, call tree, radio frequencies, protocols)
- Provide preparation and activation protocols
- Identify Emergency Operation Center locations
- Provide a management structure for emergency work
- Provide protocols for prioritizing actions
- Direct resources effectively during an emergency

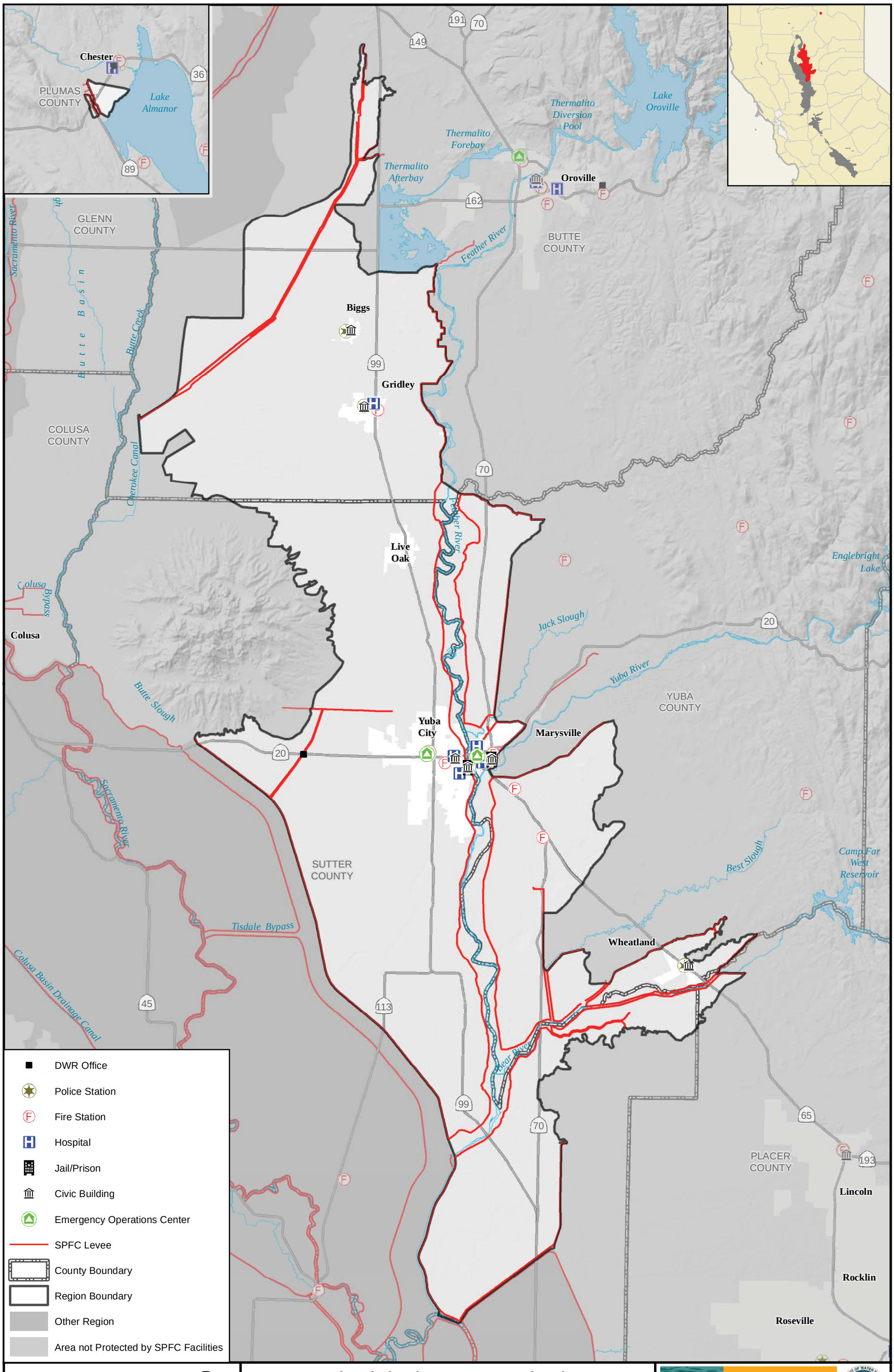


- Provide locations and procedures to obtain necessary resources (i.e., equipment, materials, manpower)
- Identify critical sites or problem areas that need special attention
- Identify critical infrastructure
- Provide an evacuation plan and rally points
- Include training and exercise schedule

LMA Emergency Action Plans support County level emergency response plans and need to be included in the flood hazard component of a Multi-Hazard Mitigation (MHM) Plan. The contact information for Flood Emergency Managers in the Feather River region is provided below. More local contact information can be found in the Directory of Flood Officials.

OA (County Agency)	**Emergency Contact #**	**Address**	**MHM Plan contains flood hazard component**
Butte County Emergency Services	530-538-7373	25 County Center Drive, Suite 200, Oroville, CA 95965	Yes
Placer County Emergency Services	530-886-5300	2968 Richardson Drive, Auburn, CA 95603	No
Sutter County Emergency Services	530-822-7400	1130 Civic Center Blvd, Yuba City, CA 95993	No
Yuba County Emergency Services	530-749-7520	915 8th Street, Suite 117, Marysville, CA 95901	Yes
State Agency	**Emergency Contact #**	**Address**	
DWR Flood Operations Center	916-574-2619	3310 El Camino Ave, Suite 200, Sacramento, CA 95821	
Cal EMA Inland Region	916-845-8911	3650 Schriever Ave, Mather, CA 95655	

DWR does not declare emergencies, order or coordinate evacuations, or coordinate shelters. DWR supports local flood emergency response by providing real-time weather and hydrology conditions and warnings, technical assistance, information dissemination, and flood fight resources through specific requests from California Emergency Management Agency (CalEMA) Operational Areas.


Chester
PLUMAS COUNTY
Lake Almanor
36
89
191
70
149
Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
Oroville
162
GLENN COUNTY
Sacramento River
Butte Basin
Butte Creek
Feather River
BUTTE COUNTY
Biggs
99
Gridley
COLUSA COUNTY
Cherokee Canal
Live Oak
Englebright Lake
Colusa Bypass
Colusa
Jack Slough
20
Yuba River
YUBA COUNTY
Butte Slough
Yuba City
Marysville
Sacramento River
SUTTER COUNTY
Best Slough
Camp Far West Reservoir
Tisdale Bypass
Wheatland
Colusa Basin Drainage Canal
45
113
Bear River
65
PLACER COUNTY
193
Lincoln
Rocklin
Roseville
DWR Office
Police Station
Fire Station
Hospital
Jail/Prison
Civic Building
Emergency Operations Center
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Flood Emergency Response Facilities
DRAFT
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FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map10_FloodER.mxd
MAP 10

Map 11 – Overall Levee Conditions

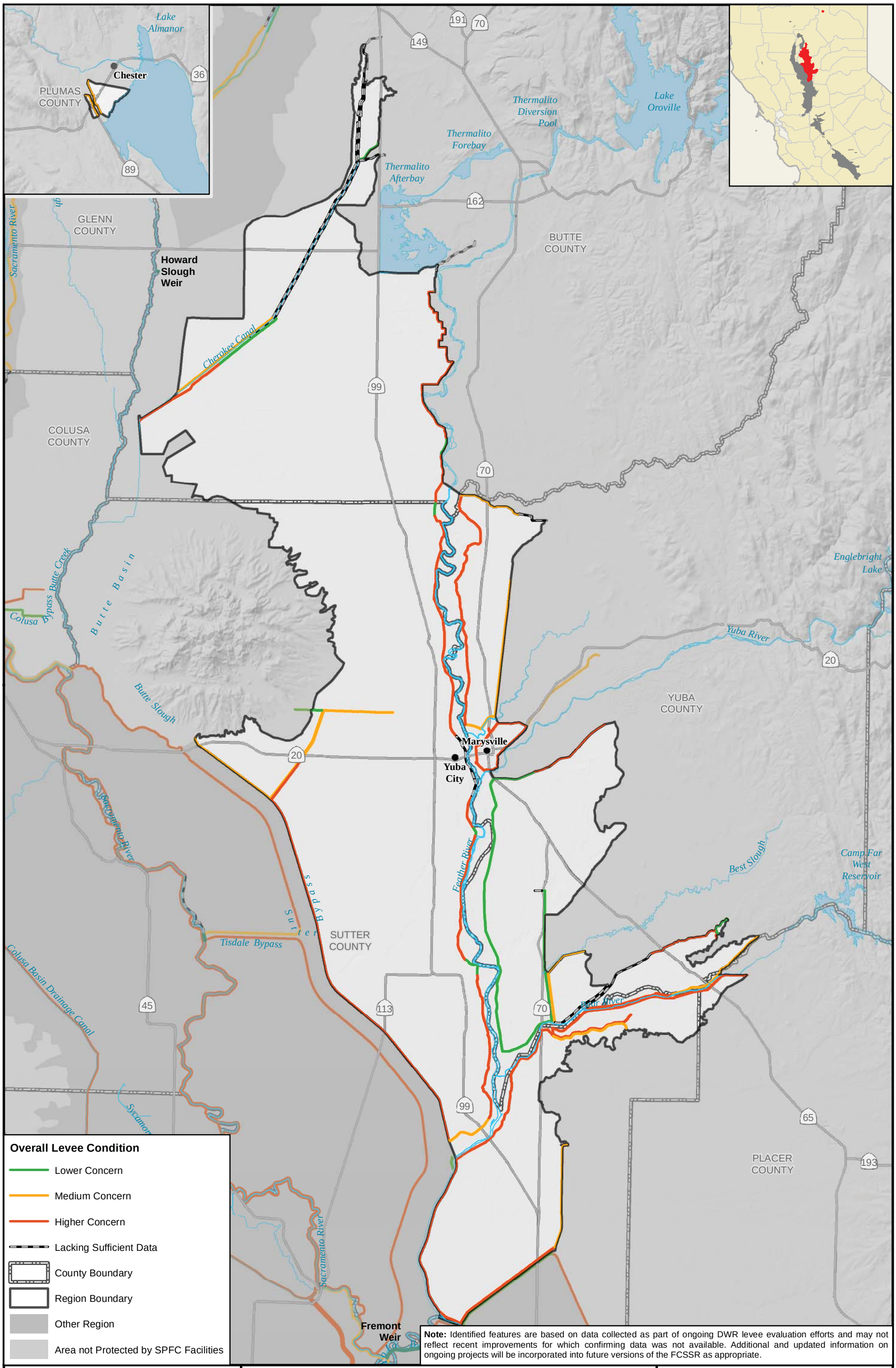
The overall physical condition of SPFC levees is shown on this map. It includes a simplified representation of levee conditions, based on Urban Levee Evaluations (ULE) and Non-Urban Levee Evaluations (NULE) results that are not directly comparable because different evaluation methodologies were used for each project. The map is intended to show broadly which levee reaches are of relatively higher, medium, and lower concern, based on physical conditions of the levees. Levees shown as purple (higher concern) on the map generally display more performance problems than those shown in green (lower concern). Results do not reflect economic or life safety consequences of flooding, which are key factors in planning system repairs and improvements.

Levee Status Factors were evaluated in the Flood Control System Status Report (FCSSR) according to the following status factors:

- Inadequate Levee Geometry (Levee Geometry Check) – Levee crest elevations that are too low, crest widths that are too narrow, and levee side slopes that are too steep can reduce levee stability and lead to failure.
- Seepage – Seepage under a levee foundation or through a levee can reduce levee stability and lead to failure.
- Structural Instability – Slides, sloughs, slope depressions or bulges can reduce levee stability and lead to failure.
- Erosion – Levee and bank erosion can directly reduce levee cross sections and shorten seepage paths, leading to failure.
- Settlement – Levee settlement or land subsidence over years can result in levee crest elevations lower than designed, reducing freeboard or causing water to overtop a levee.
- Penetrations – Irrigation and drainage pipes, utilities, and other structures through levees may create seepage paths. Seepage along the penetrations, or through deteriorating penetrations, could wash away levee material and lead to failure. Lack of positive closure devices on pipes penetrating levees can also lead to localized flooding.
- Levee Vegetation – Vegetation on levees can interfere with floodfighting efforts and maintenance by reducing visibility and accessibility. The extent that levee vegetation impacts levee integrity is the subject of ongoing research.
- Rodent Damage – Burrowing animals can create holes in levees that can create seepage paths and lead to levee failure.
- Encroachments – Encroachments (such as debris, fences, and structures) on SPFC facilities can interfere with floodfighting efforts and maintenance and, in some cases, reduce levee stability, which can lead to levee failure.

Note: Identified features are based on data collected as part of ongoing DWR levee evaluation efforts and may not reflect recent improvements for which confirmed data was not available.

The overall physical condition of SPFC levees is based on Urban Levee Evaluations and Non-Urban Levee Evaluations, and inspections completed by Local Maintaining Agencies (LMA's) and DWR


Lake Almanor
Chester
PLUMAS COUNTY
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Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
162
GLENN COUNTY
Sacramento River
Howard Slough Weir
BUTTE COUNTY
Cherokee Canal
99
COLUSA COUNTY
Colusa Bypass
Butte Creek
Butte Basin
Butte Slough
Englebright Lake
Yuba River
20
YUBA COUNTY
Marysville
Yuba City
Feather River
Best Slough
Camp Far West Reservoir
Sutter Bypass
Tisdale Bypass
SUTTER COUNTY
Colusa Basin Drainage Canal
45
113
70
99
65
PLACER COUNTY
193
Sacramento River
Fremont Weir
Overall Levee Condition
Lower Concern
Medium Concern
Higher Concern
Lacking Sufficient Data
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: Identified features are based on data collected as part of ongoing DWR levee evaluation efforts and may not reflect recent improvements for which confirming data was not available. Additional and updated information on ongoing projects will be incorporated into future versions of the FCSSR as appropriate.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Overall Levee Conditions
DRAFT
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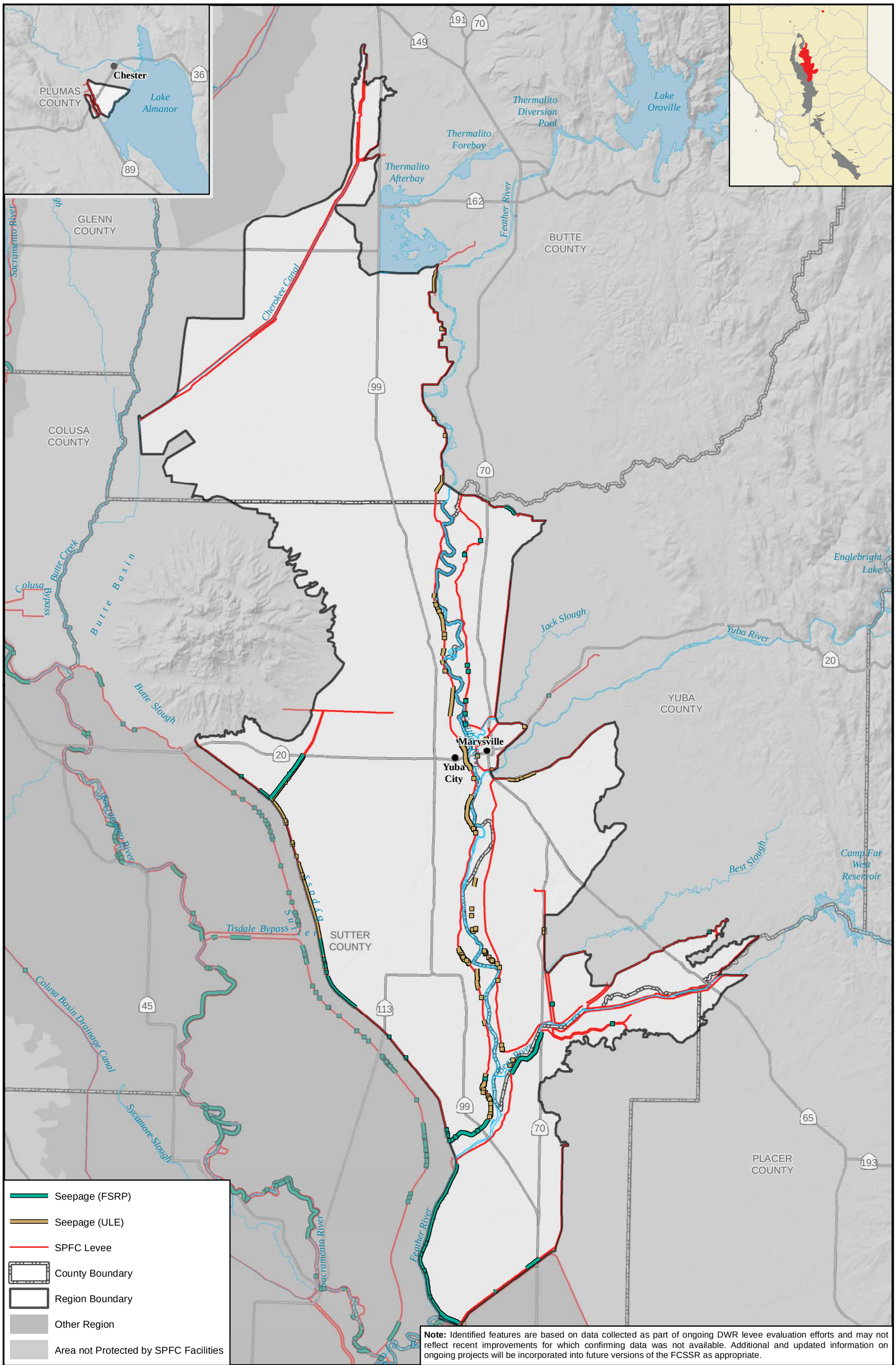
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map11_Hazard_overall.mxd
MAP 11

Map 12 – Seepage Past Performance Problems

This map shows the seepage past performance problems based on information collected as part of ongoing DWR levee evaluation efforts, Urban Levee Evaluation (ULE) program and the Flood System Repair Program (FSRP), and may not reflect recent improvements for which confirming data was not available. This information was originally presented in the *Flood Control System Status Report (FCSSR)* (December 2011).

An example of seepage


Chester
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Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
162
Feather River
GLENN COUNTY
BUTTE COUNTY
Sacramento River
Cherokee Canal
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COLUSA COUNTY
Butte Creek
Colusa Bypass
Butte Basin
Butte Slough
Englebright Lake
Jack Slough
Yuba River
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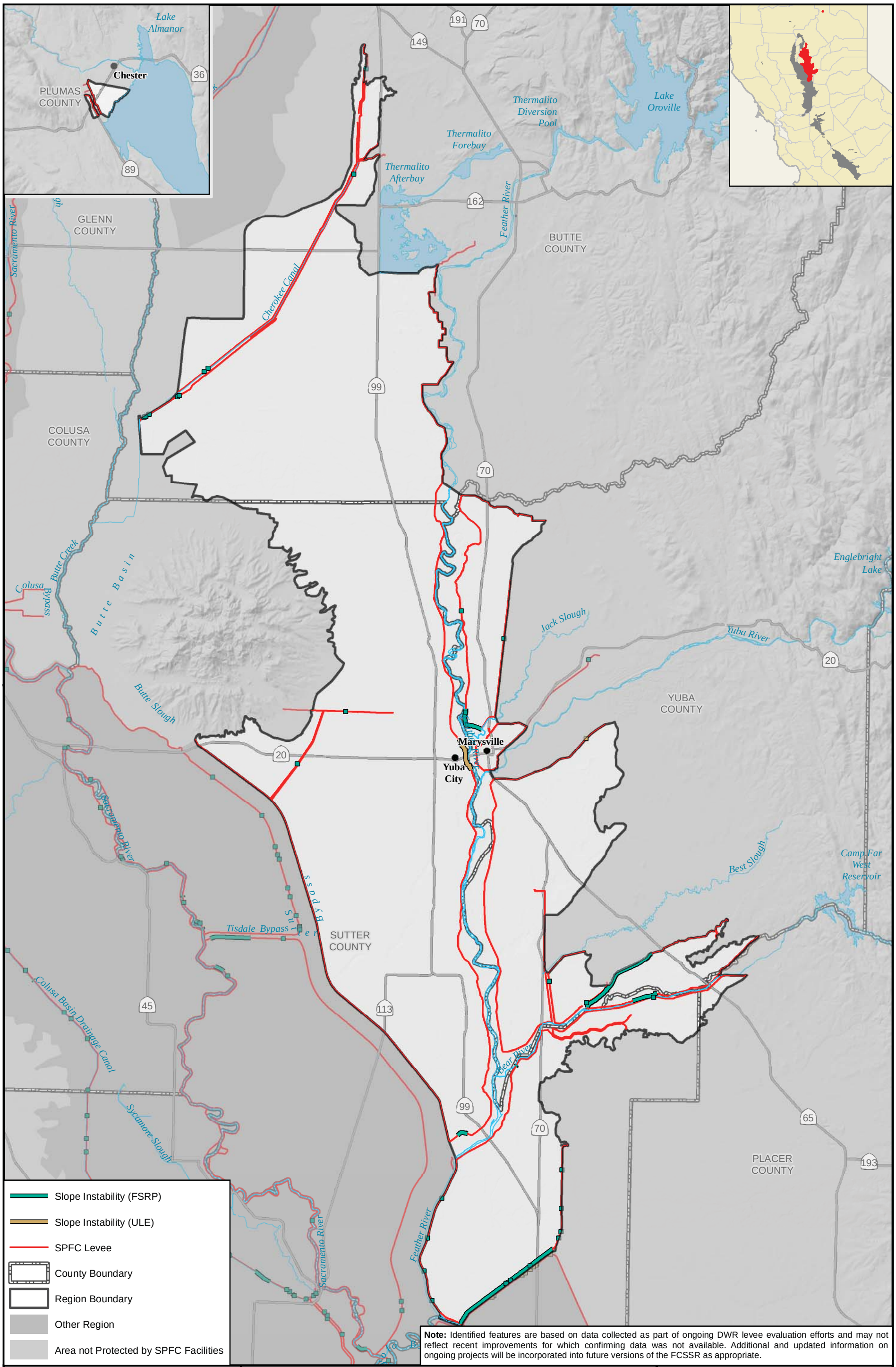
YUBA COUNTY
Marysville
Yuba City
Sacramento River
Best Slough
Camp Far West Reservoir
Tisdale Bypass
Sutter Bypass
SUTTER COUNTY
Colusa Basin Drainage Canal
45
113
Sycamore Slough
Feather River
Sacramento River
65
70
PLACER COUNTY
193
Seepage (FSRP)
Seepage (ULE)
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: Identified features are based on data collected as part of ongoing DWR levee evaluation efforts and may not reflect recent improvements for which confirming data was not available. Additional and updated information on ongoing projects will be incorporated into future versions of the FCSSR as appropriate.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Seepage Past Performance Problems
DRAFT
DRAFT
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map12_Seepage.mxd
MAP 12

Map 13 – Slope Instability Past Performance Problems

This map shows the slope instability past performance problems based on information collected as part of ongoing DWR levee evaluation efforts, Urban Levee Evaluation (ULE) program and the Flood System Repair Program (FSRP), and may not reflect recent improvements for which confirming data was not available. This information was originally presented in the *Flood Control System Status Report (FCSSR)* (December 2011).

An example of slope instability


Lake Almanor
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PLUMAS COUNTY
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Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
162
Feather River
GLENN COUNTY
BUTTE COUNTY
Sacramento River
Cherokee Canal
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COLUSA COUNTY
Butte Creek
Colusa Bypass
Butte Basin
Butte Slough
Englebright Lake
Jack Slough
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YUBA COUNTY
Marysville
Yuba City
Sacramento River
Best Slough
Camp Far West Reservoir
Tisdale Bypass
Sutter Bypass
SUTTER COUNTY
Colusa Basin Drainage Canal
45
113
Sycamore Slough
Bear River
65
70
PLACER COUNTY
193
Slope Instability (FSRP)
Slope Instability (ULE)
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: Identified features are based on data collected as part of ongoing DWR levee evaluation efforts and may not reflect recent improvements for which confirming data was not available. Additional and updated information on ongoing projects will be incorporated into future versions of the FCSSR as appropriate.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Slope Instability Past Performance Problems
DRAFT
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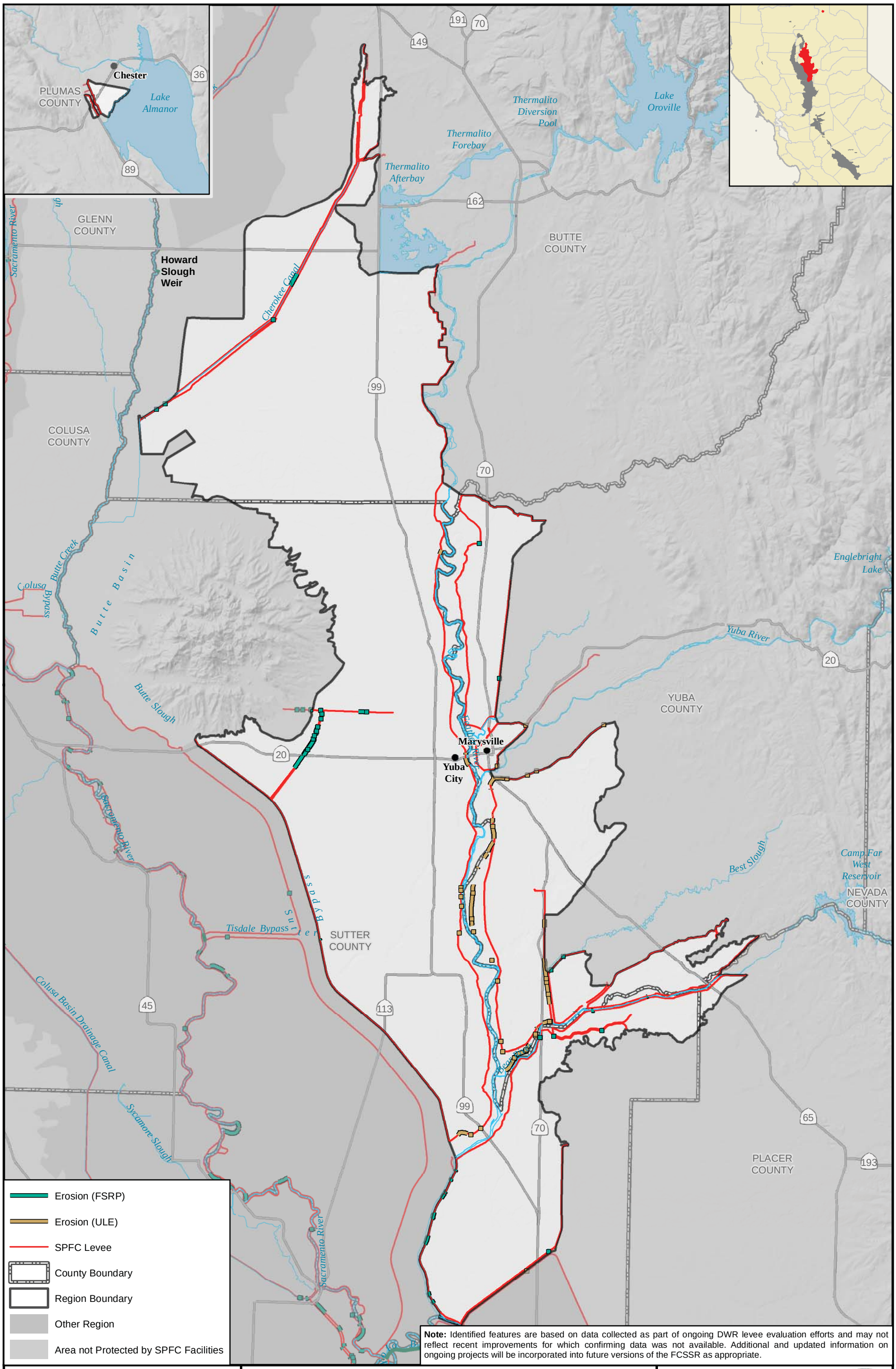
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map13_SlopeInstability.mxd
MAP 13

Map 14 – Erosion Past Performance Problems

This map shows the erosion past performance problems based on information collected as part of ongoing DWR levee evaluation efforts, Urban Levee Evaluation (ULE) program and the Flood System Repair Program (FSRP), and may not reflect recent improvements for which confirming data was not available. This information was originally presented in the *Flood Control System Status Report (FCSSR)* (December 2011).

An example of erosion


Chester
PLUMAS COUNTY
Lake Almanor
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Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
162
GLENN COUNTY
Sacramento River
Howard Slough Weir
Cherokee Canal
BUTTE COUNTY
99
COLUSA COUNTY
Colusa Bypass
Butte Creek
Butte Basin
Butte Slough
Englebright Lake
Yuba River
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YUBA COUNTY
Feather River
Marysville
Yuba City
Sacramento River
Best Slough
Camp Far West Reservoir
NEVADA COUNTY
Tisdale Bypass
Sutter Bypass
SUTTER COUNTY
Colusa Basin Drainage Canal
45
113
Sycamore Slough
65
PLACER COUNTY
193
Erosion (FSRP)
Erosion (ULE)
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: Identified features are based on data collected as part of ongoing DWR levee evaluation efforts and may not reflect recent improvements for which confirming data was not available. Additional and updated information on ongoing projects will be incorporated into future versions of the FCSSR as appropriate.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Erosion Past Performance Problems
DRAFT
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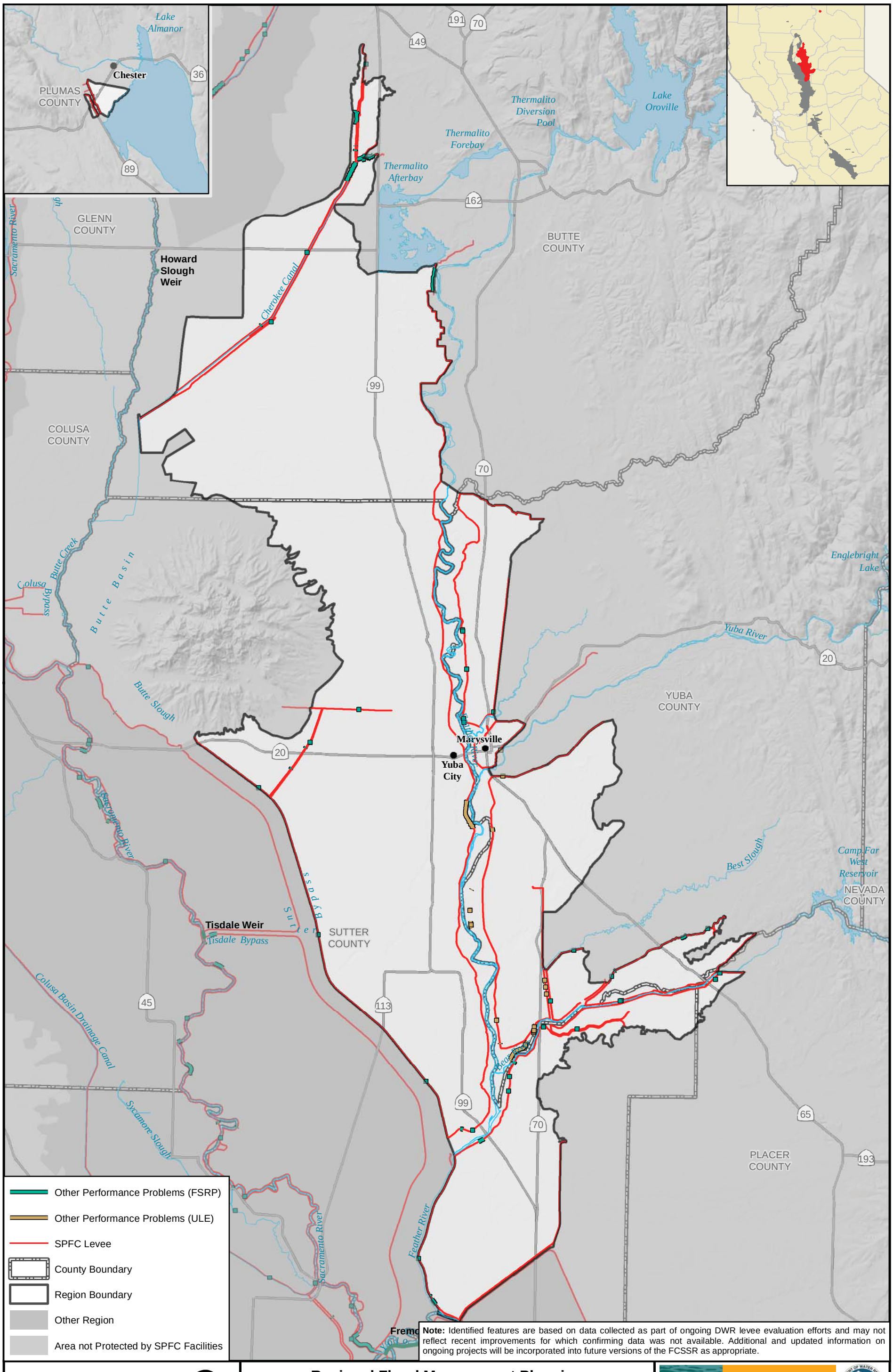
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map14_Erosion.mxd
MAP 14

Map 15 – Other Past Performance Problems

This map shows information collected, outside of seepage, levee stability, and erosion issues, as part of ongoing DWR levee evaluation efforts, Urban Levee Evaluation (ULE) program and the Flood System Repair Program (FSRP).

The "other" performance problem category generally includes – historical overtopping, breach occurrences, relief cuts, subsidence, burrows, and anthropogenic damage. This data may not reflect recent improvements for which confirming data was not available. This information was originally presented in the *Flood Control System Status Report (FCSSR)* (December 2011).

An example of a levee breach


Lake Almanor
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PLUMAS COUNTY
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Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
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GLENN COUNTY
Sacramento River
Howard Slough Weir
Cherokee Canal
BUTTE COUNTY
99
COLUSA COUNTY
Butte Basin
Colusa Bypass
Butte Creek
Butte Slough
Englebright Lake
Yuba River
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YUBA COUNTY
Marysville
Yuba City
Sacramento River
Best Slough
Camp Far West Reservoir
NEVADA COUNTY
Tisdale Weir
Tisdale Bypass
Sutter Bypass
SUTTER COUNTY
45
113
Colusa Basin Drainage Canal
Sycamore Slough
Feather River
Sacramento River
70
65
PLACER COUNTY
193
Other Performance Problems (FSRP)
Other Performance Problems (ULE)
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: Identified features are based on data collected as part of ongoing DWR levee evaluation efforts and may not reflect recent improvements for which confirming data was not available. Additional and updated information on ongoing projects will be incorporated into future versions of the FCSSR as appropriate.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Other Past Performance Problems
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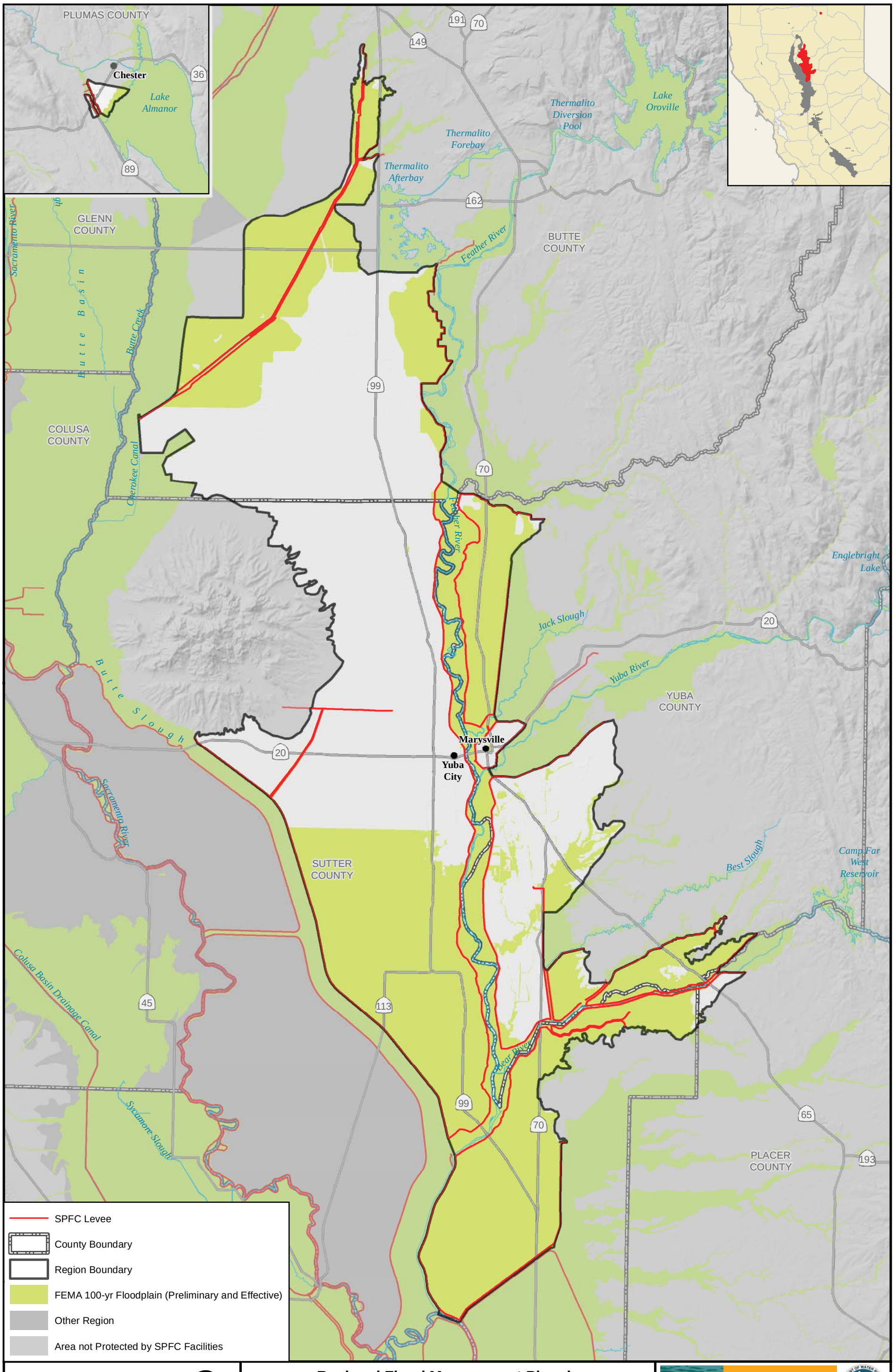
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map15_OtherProblems.mxd
MAP 15

Map 16 – FEMA 100-Year Floodplain

FEMA flood zones are geographic areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM). The FEMA 100-year floodplain represents the flood zones that are subject to flooding from the 1% annual chance flood. The FEMA 100-year floodplains were obtained from FEMA in February 2013. For the latest floodplain information, please visit FEMA's Map Service Center at http://msc.fema.gov/. The FEMA effective floodplains are shown on FEMA's Effective Flood Insurance Rate Maps and used for regulatory purposes.

1997 flood, Arboga levee failure


PLUMAS COUNTY
Chester
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Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Thermalito Afterbay
162
GLENN COUNTY
Sacramento River
Butte Basin
Butte Creek
Feather River
BUTTE COUNTY
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COLUSA COUNTY
Cherokee Canal
Feather River
Englebright Lake
Jack Slough
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Yuba River
YUBA COUNTY
Marysville
Yuba City
Butte Slough
Sacramento River
SUTTER COUNTY
Best Slough
Camp Far West Reservoir
Colusa Basin Drainage Canal
45
113
Bear River
Sycamore Slough
65
PLACER COUNTY
193
SPFC Levee
County Boundary
Region Boundary
FEMA 100-yr Floodplain (Preliminary and Effective)
Other Region
Area not Protected by SPFC Facilities
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
FEMA 100-Year Floodplain
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FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map16_FloodInundation_FEMA.mxd
MAP 16

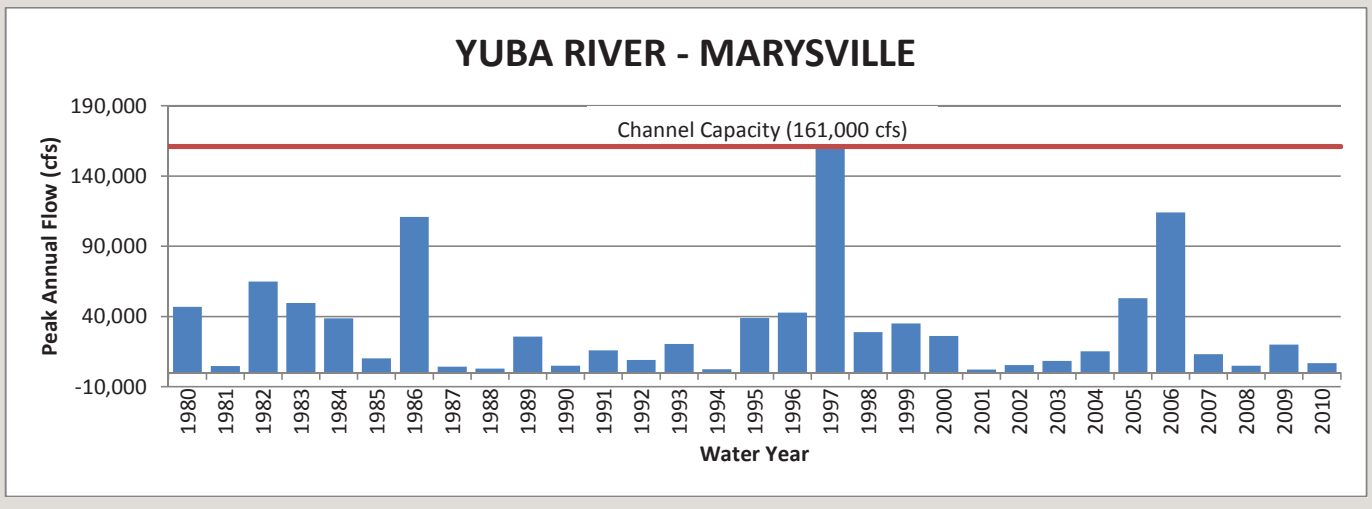
Map 17 – Channel Capacities and Flood Forecast Monitoring Network

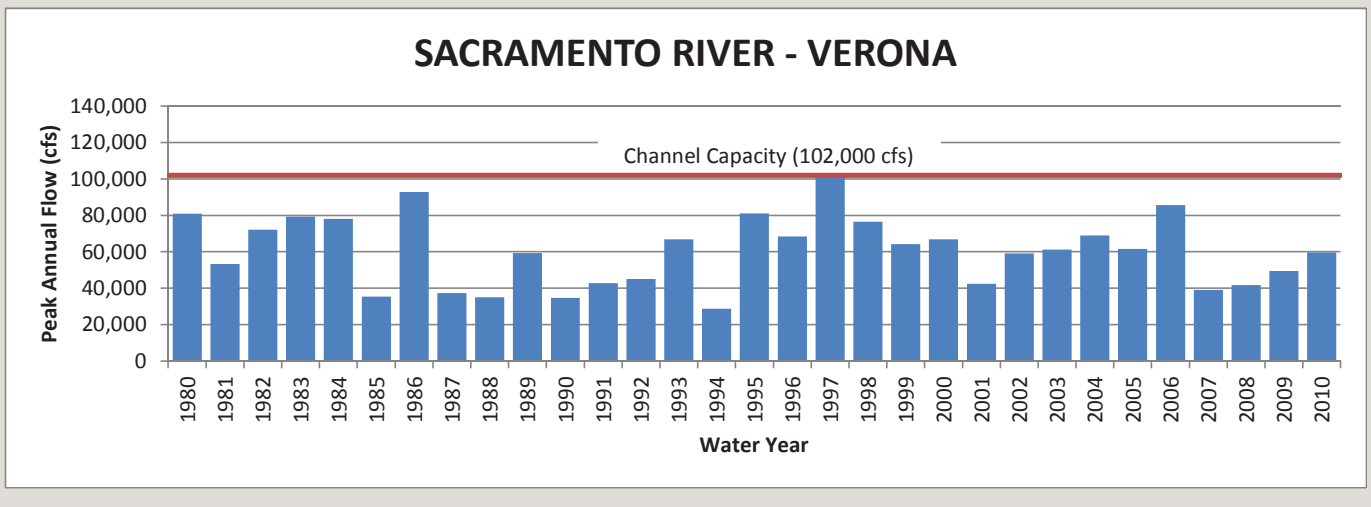
Conveyance capacity is defined as the maximum rate of flowing water, usually expressed in cubic feet per second (cfs), that a river, canal, or bypass can carry without exceeding a threshold value such as flood discharge, or without using the freeboard distance from the top of a levee.

Design Channel Capacity - Design channel capacities were calculated from the design profiles based on steady-state, uniform flow hydraulic computations of historical floods using data available at the time. Therefore, design channel capacities were based on a very limited hydrological record, were highly dependent on the boundary conditions assumed, and did not consider variations in flow and depth with respect to time and distance. Furthermore, the design profiles could not account for changes in vegetation and sedimentation patterns within the channels, or flood system improvements that have taken place after the historical floods used to derive the design flood flow capacities. For example, the 1955 historical flood used to determine the 1955 design profile for the San Joaquin River downstream from the Merced River confluence occurred before construction of the San Joaquin River bypass system.

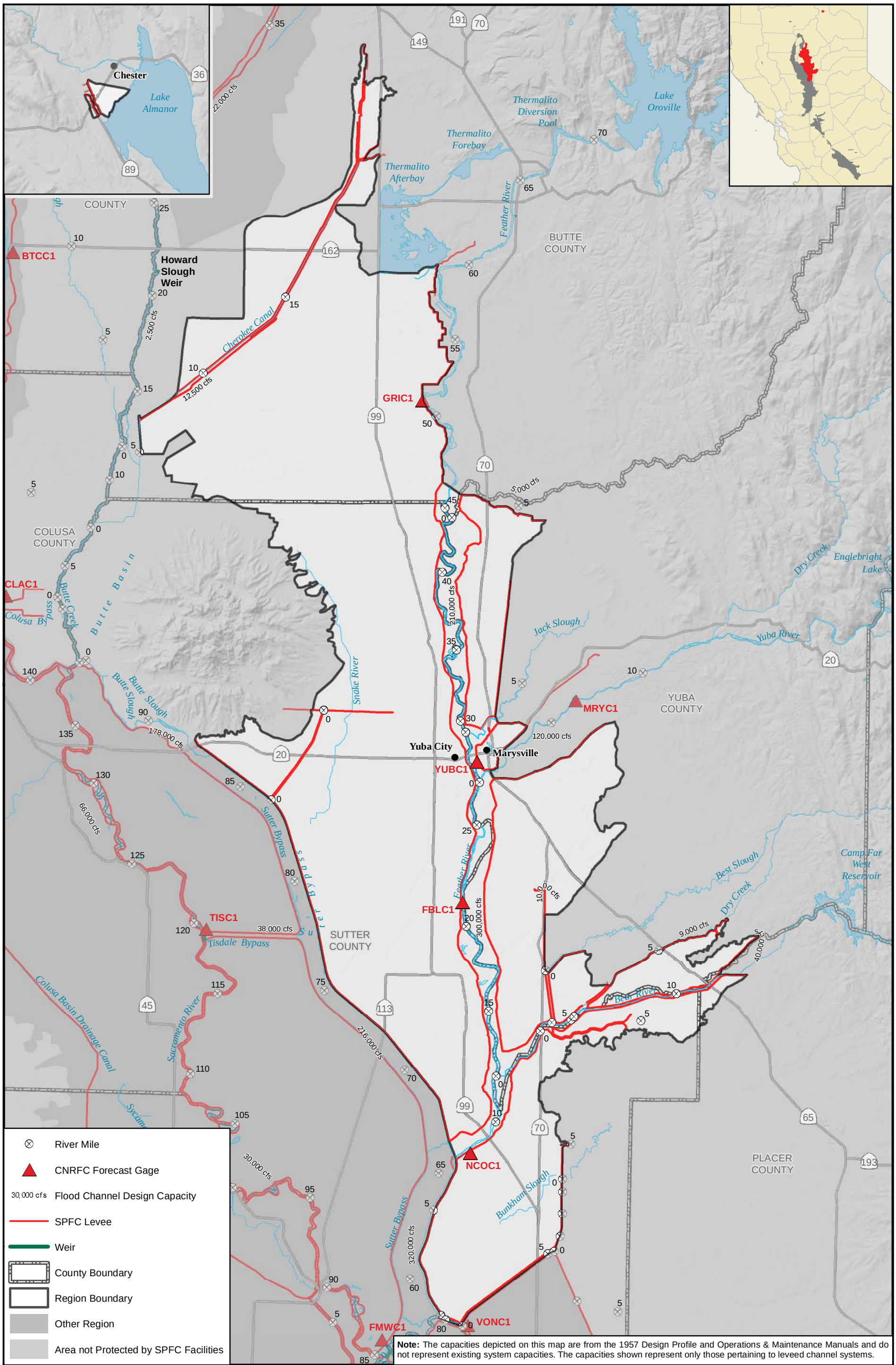
Flood Monitoring Network - Under the authority of the California Water Code Section 236, the River Forecasting Section works with the National Weather Service's California-Nevada River Forecast Center (CNRFC) to provide year-round daily forecasts of reservoir inflows, river flows, and water levels throughout California and in parts of Nevada. These forecasts are used by the Flood Operations Branch and the National Weather Service to determine the level of joint Federal-State flood response activation and operations. During high water events, Federal and State river forecasters work around the clock to update their forecasts and monitor real-time changes in California and Nevada's larger rivers and estuaries.

Gages are located throughout the Sacramento and San Joaquin River Systems. The peak annual flow is shown for selected gages for the 1980 to 2010 period where historical flow data was readily available. In the Feather River Region the peak annual flows at the Yuba River–Marysville and Sacramento River–Verona forecast points are shown in the bar charts below.





Feather River Flood in Yuba


Chester
Lake Almanor
Lake Oroville
Thermalito Diversion Pool
Thermalito Forebay
Thermalito Afterbay
Feather River
Howard Slough Weir
BTCC1
GRIC1
Cherokee Canal
12,500 cfs
2,500 cfs
22,000 cfs
5,000 cfs
210,000 cfs
300,000 cfs
120,000 cfs
178,000 cfs
66,000 cfs
38,000 cfs
216,000 cfs
30,000 cfs
320,000 cfs
9,000 cfs
40,000 cfs
BUTTE COUNTY
COLUSA COUNTY
YUBA COUNTY
SUTTER COUNTY
PLACER COUNTY
Butte Basin
Butte Creek
Butte Slough
Colusa Bypass
Sutter Bypass
Snake River
Jack Slough
Yuba River
Dry Creek
Englebright Lake
Best Slough
Camp Far West Reservoir
Bear River
Bunkham Slough
Colusa Basin Drainage Canal
Sacramento River
Tisdale Bypass
CLAC1
TISC1
MRYC1
YUBC1
FBLC1
NCOC1
VONC1
FMWC1
Yuba City
Marysville
River Mile
CNRFC Forecast Gage
Flood Channel Design Capacity
SPFC Levee
Weir
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
Note: The capacities depicted on this map are from the 1957 Design Profile and Operations & Maintenance Manuals and do not represent existing system capacities. The capacities shown represent only those pertaining to leveed channel systems.
1 " = 4 miles
Miles
0 1 2 4
Datum: NAD 83
Zone: N/A
Projection: CA (Teale) Albers
Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Channel Capacities and Flood
Forecast Monitoring Network
DRAFT
DRAFT
FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map17_ChannelCapacities.mxd
MAP 17

Map 18 – Managed Environmental Lands

This map shows the extent of lands that are currently being managed by federal, State, or private entities. The current mapped information is listed below:

- National Wildlife Refuge, USFWS, 2011.
  - » Description from metadata: "This data layer depicts the simplified boundaries of lands and waters administered by the U.S. Fish and Wildlife Service (USFWS) in North America, U.S. Trust Territories and Possessions. It includes only lands that are held by fee or secondary title by USFWS. The primary source for this information is the USFWS Realty program."
- Department of Fish & Game Lands, DFG, 2011.
  - » This layer is includes all of DFG (now Department of Fish and Wildlife) Owned and Operated Lands. These are only lands owned with fee title. The only lands shown on Map 13 are those designated as "Ecological Reserve" or "Wildlife Area".
- The Nature Conservancy Lands, TNC, 2011.
  - » Description from metadata: "A spatial dataset of lands and waters that The Nature Conservancy has a legal interest in (such as a conservation easement or fee-simple ownership). Includes spatial data from TNC's Conservation Lands System (CLS) database, which is the legal database of record for all TNC land transactions (fee, easement, lease and deed restrictions)."

Feather River Region Managed Environmental Lands

Managed Land Type	Area (square miles)	Acres
National Wildlife Refuge (USFWS)	<1	506
Department of Fish and Wildlife Lands	19	12,184

Described managed lands are those lands located within the region or adjacent to the region.

Feather River Wildlife Area

Feather River Wildlife Area is managed by DFW for fishing, birding, wildlife viewing, and hunting. The wildlife area is 2,522 acres of dense riparian overstory of valley oaks and cottonwoods, with an understory of wild grape, pipevine, and California rose. Abbott and O'Connor Lakes are within this area. Some areas are accessible only by boat.

Fremont Weir Wildlife Area

The Fremont Weir Wildlife Area is located just south of the Region Boundary. It consists of 1,461 acres of tall weedy vegetation, brush, valley oaks, willows and cottonwood trees. Fishing, birdwatching, and wildlife viewing are permitted. Fremont Weir Wildlife Area is located just south of the region.

Gray Lodge Wildlife Area

Gray Lodge Wildlife Area is 9,100 acres along the Pacific Flyway managed for wildlife by DFW. Educational programs, informative exhibits, a self-guided nature trail and seasonal guided tours delight thousands of visitors every year. Wildlife viewing is available year round, hunting is permitted during specific seasons, and fishing is popular in the spring and summer.

Oroville Wildlife Area

Managed by the California Department of Fish and Wildlife, the 11,869 acre Wildlife Area in Oroville is primarily riparian woodland habitat along the Feather River and grasslands around the Thermalito Afterbay. Wildlife species seen in the area include coyote, badger, fox, bobcat, porcupine, osprey, white-tailed kite, egrets, woodpeckers, and warblers. The area is located just outside the northeastern boundary of the region.

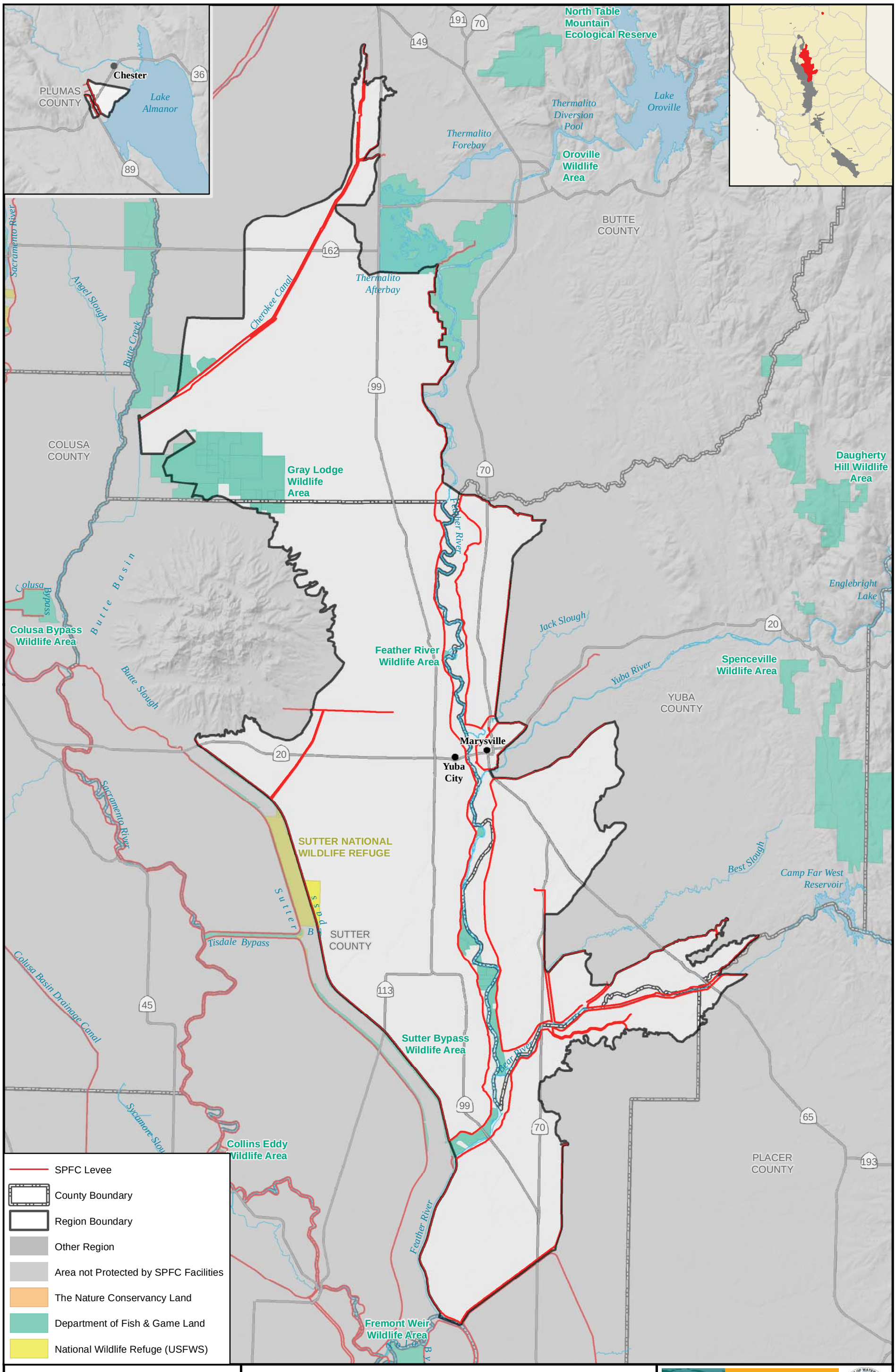
Sutter National Wildlife Refuge

The Sutter National Wildlife Refuge is about 2,600 acres consisting primarily of wetland impoundments with some riparian and grassland habitats. The refuge typically supports 175,000 ducks and 50,000 geese. The refuge is located within the Sutter Bypass.

Sutter Bypass Wildlife Area

The Sutter Bypass Wildlife Area is managed by California Department of Fish and Wildlife (DFW) for fishing, hunting, and wildlife viewing. It consists of the Tisdale Bypass and two long, narrow parcels on either side of the Sutter Bypass, for a total of 3,204 acres.

Federal and State managed lands provide habitat for wildlife


Chester
PLUMAS COUNTY
Lake Almanor
36
89
191
70
149
North Table Mountain Ecological Reserve
Thermalito Diversion Pool
Lake Oroville
Thermalito Forebay
Oroville Wildlife Area
BUTTE COUNTY
Sacramento River
Angel Slough
Butte Creek
Cherokee Canal
162
Thermalito Afterbay
99
COLUSA COUNTY
Gray Lodge Wildlife Area
Daugherty Hill Wildlife Area
Feather River
Englebright Lake
Colusa Bypass
Butte Basin
Colusa Bypass Wildlife Area
Butte Slough
Jack Slough
20
Feather River Wildlife Area
Yuba River
Spenceville Wildlife Area
YUBA COUNTY
Marysville
Yuba City
SUTTER NATIONAL WILDLIFE REFUGE
Sacramento River
Best Slough
Camp Far West Reservoir
Sutter Bypass
SUTTER COUNTY
Tisdale Bypass
Colusa Basin Drainage Canal
45
113
Sutter Bypass Wildlife Area
Bear River
65
Sycamore Slough
Collins Eddy Wildlife Area
PLACER COUNTY
193
Feather River
Fremont Weir Wildlife Area
SPFC Levee
County Boundary
Region Boundary
Other Region
Area not Protected by SPFC Facilities
The Nature Conservancy Land
Department of Fish & Game Land
National Wildlife Refuge (USFWS)
1 " = 4 miles
Miles
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Datum: NAD 83
Zone: N/A
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Units: meters
Sources: See Appendix for source citations
Regional Flood Management Planning
Feather River
Managed Environmental Lands
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FloodSAFE CALIFORNIA
DEPARTMENT OF WATER RESOURCES
Prepared By: K. Miller
Date: May 10, 2013
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MAP 18

Map 19 – Riparian Vegetation, Critical Habitat, and Endangered and Threatened Species

Riparian Vegetation

Riparian vegetation is a habitat type that is characterized by trees, other vegetation and physical features normally found on the stream banks and flood plains associated with streams, lakes, or other bodies of water. Riparian systems provide several important functions to both the aquatic and terrestrial ecosystems associated with them. These include, but are not limited to, stream bank stabilization, flow moderation and flood control, sediment control, organic matter necessary to support aquatic communities, water quality improvement by filtration, temperature moderation by shading, and stream structural diversity. Riparian habitats support a great diversity of wildlife, including sensitive invertebrates, amphibians, reptiles, birds, and mammals.

The Feather River Region has areas of riparian, wetland, and broadleaf forest and woodland along the Feather River and its tributaries.

Designated Critical Habitat

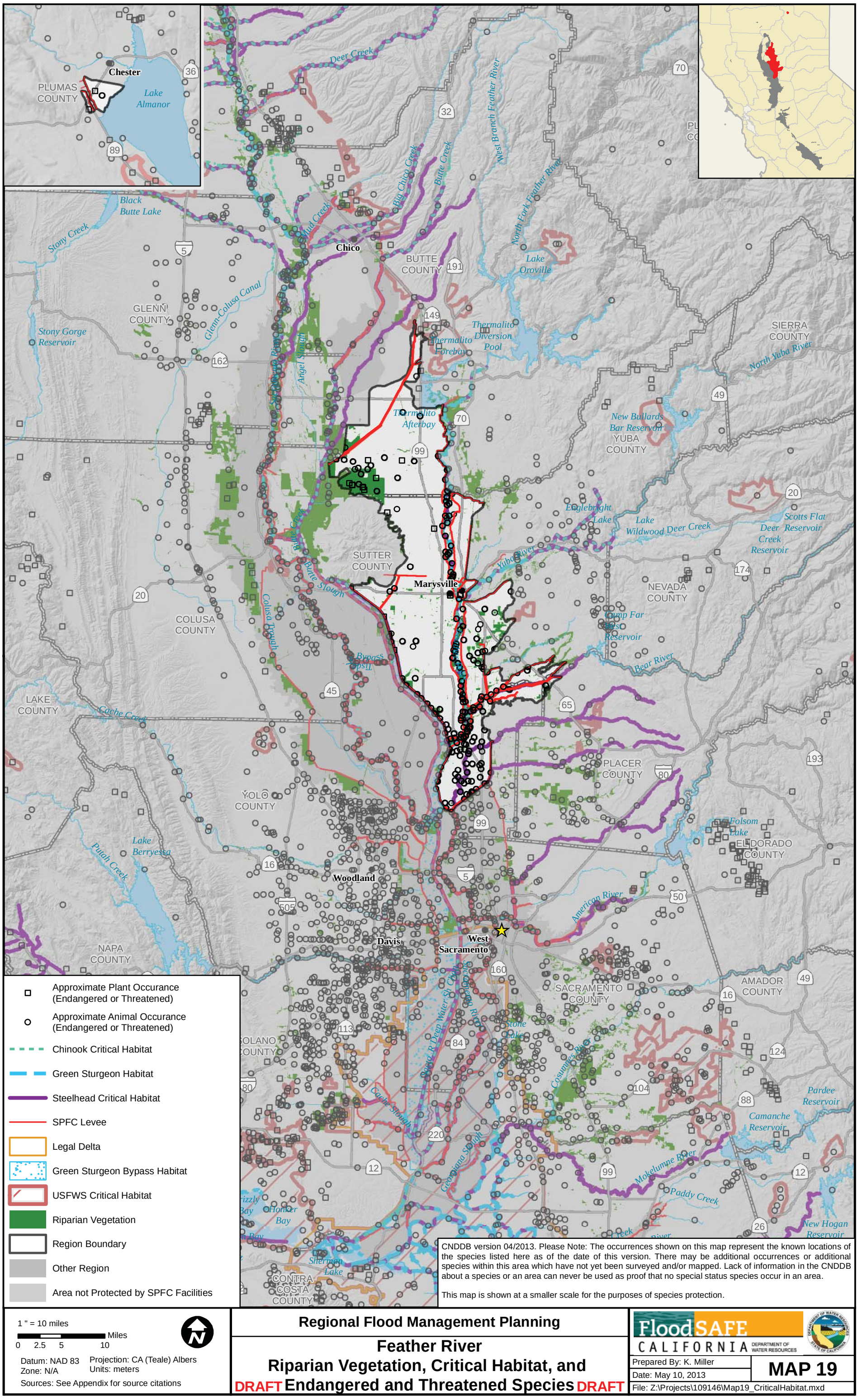
Designated Critical habitat is a term defined in the Endangered Species Act and used by US Fish and Wildlife Service and the National Marine Fisheries Service. Designated Critical Habitat is a geographic area that is essential for the conservation and recovery of a federally threatened or endangered species that requires special management and protection. It may include an area that is not currently occupied by the species but that will be needed for its recovery. Critical habitats are designated to ensure that actions authorized by federal agencies will not destroy or adversely modify critical habitat, thereby protecting areas necessary for the conservation of the species. Not all federally listed species have designated critical habitat.

Endangered and Threatened Species

Critical habitat for Vernal pool tadpole shrimp (Lepidurus packardi), Vernal pool fairy shrimp (Branchinecta lynchi), and Butte County meadowfoam (Limnanthes floccosa ssp. Californica) is found on the very northern and eastern edges of the region. Critical habitat for the Green Sturgeon (Acipenser medirostris), the Central Valley steelhead (Anadromous O. mykiss) and the Central Valley Chinook salmon (Oncorhynchus tshawytscha) occur within the region.

Note: Endangered and Threatened species data shown are representative of occurrence areas defined by the California Natural Diversity Database.

The Feather River Region contains designated critical habitat for the Vernal pool tadpole shrimp and Vernal pool fairy shrimp



CNDDB version 04/2013. Please Note: The occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not yet been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area.

This map is shown at a smaller scale for the purposes of species protection.

1 " = 10 miles

0 2.5 5 10 Miles

Datum: NAD 83
Zone: N/A

Projection: CA (Teale) Albers
Units: meters

Sources: See Appendix for source citations

Regional Flood Management Planning

Feather River
Riparian Vegetation, Critical Habitat, and
DRAFT Endangered and Threatened Species DRAFT

FloodSAFE CALIFORNIA — DEPARTMENT OF WATER RESOURCES

Prepared By: K. Miller
Date: May 10, 2013
File: Z:\Projects\109146\Map19_CriticalHabitat.mxd

MAP 19

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Glossary

100-year flood event	The flood having a 1-in-100 (1 percent) chance of being equaled or exceeded in any given year. A structure located within a special flood hazard area shown on a National Flood Insurance Program map has a 26% chance of suffering flood damage during the term of a 30 year mortgage. *Federal Emergency Management Agency, http://www.fema.gov/, accessed February 2013*
200-year floodplain	An area that has a 1-in-200 (0.5 percent) chance of flooding in any given year, based on hydrological modeling and other engineering criteria accepted by the Department of Water Resources. *California Government Code Section 65300.2(a)*
conveyance capacity	The maximum rate of flowing water, usually expressed in cubic feet per second (cfs), that a river, canal, or bypass can carry without exceeding a threshold value such as flood discharge, or without using the freeboard distance from the top of a levee.
designated floodway	Means the channel of a stream and that portion of the adjoining flood plain required to reasonably provide for the construction of a project for passage of the design flood including the lands necessary for construction of project levees.
essential public facilities	Essential public facilities include, but not limited to, hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities. *California Government Code Section 65302*
flood basin	A bowl-shaped, natural landform that historically or presently receives and retains floodwaters, or an engineered floodwater detention basin, excavated below grade or surrounded by levees.
flood bypass	An engineered wide and shallow channel or confined floodplain, usually flanked by levees, that receives floodwaters to reduce the amount of flow in a river or stream.
flood corridor	A passageway for floodflows, including, but not limited to, bypass systems, channels, levee systems, floodplain easements, culverts, floodwalls, or a combination thereof.
floodway, State-designated	The channel of a stream and that portion of the adjoining floodplain required to reasonably provide for construction of a project for passage of the design flood, including the lands necessary for construction of project levee that are regulated by the Central Valley Flood Protection Board.
freeboard	Vertical distance from the normal water surface to the top of a confining wall.
integrated flood management	An approach to dealing with flood risk that recognizes the interconnection of flood management actions within broader water resources management and land use planning; the value of coordinating across geographic and agency boundaries; the need to evaluate opportunities and potential impacts from a system perspective; and the importance of environmental stewardship and sustainability. *California Department of Water Resources, Draft FloodSAFE Strategic Plan, June 2008*
local jurisdiction	Means a city, city and county, or county.
Levee Flood Protection Zone	An area that is protected, as determined by the Central Valley Flood Protection Board or the Department of Water Resources, by a levee that is part of the facilities of the State Plan of Flood Control, as defined under Section 5096.805 of the Public Resources Code. *California Government Code Section 65300.2(b)*
maintaining agency	Maintaining agency means any city, county, district or other political subdivision of the State that is authorized to maintain levees. The California Department of Water Resources maintains levees pursuant to California Water Code Sections 8361 and 12878, but is not considered a maintaining agency.
non-project levee	Any levee that is not part of the State Plan of Flood Control (CWC 9602(c)) or other State-federal or local-federal flood protection facilities. Nonproject levees are typically privately owned or under the authority of a local levee district.1
non-SPFC levee	Any levee that is not part of the State Plan of Flood Control (CWC 9602(c)). This includes State-federal levees outside the Sacramento and San Joaquin river watersheds and levees within the Sacramento and San Joaquin river watersheds that do not have documented State assurances of nonfederal cooperation to the federal government or State responsibility identified in CWC Section 8361.
project levee	Any levee that is a facility of the State Plan of Flood Control.[1] *California Water Code 9602 (c) California Water Code 9602 (c)*
riparian area	Riparian areas are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. Riparian areas include portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., a zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines.
rural community	A city, town, or settlement outside of urban and urbanizing areas with an expected population of less than 10,000 within the next 10 years.
Sacramento-San Joaquin Drainage (SSJD) District	Comprises more than 1.9 million acres in the Central Valley generally along and adjacent to the Sacramento and San Joaquin rivers. SSJD District was created in 1913 by the California Legislature to allow survey work and the collection of data of the San Joaquin and Sacramento rivers and tributaries to prepare a report to the Central Valley Flood Protection Board to further the Board's plans for controlling the floodwaters of the rivers, improve and preserve navigation, and the reclamation and protection of the lands that are susceptible to overflow from those rivers and their tributaries. The District's management and control is vested in the Central Valley Flood Protection Board, and according to the Statute, the District can "acquire, own, hold, use, and enjoy any and all properties necessary for the purposes of the District." *Central Valley Flood Protection Board, http://www.cvfpb.ca.gov/, accessed June 2009*
Sacramento-San Joaquin River Flood Management System	The Sacramento-San Joaquin River Flood Management System comprises all of the following: (a) The facilities of the State Plan of Flood Control as that plan may be amended by the Central Valley Flood Protection Board; (b) Any existing dam, levee, or other flood management facility that is not part of the State Plan of Flood Control if the board determines, upon recommendation of the department, that the facility does one or more of the following: (1) Provides significant systemwide benefits for managing flood risks within the Sacramento-San Joaquin Valley. (2) Includes project levees that protect a contiguous urban area of 10,000 or more residents within the Sacramento- San Joaquin Valley. *California Water Code Sections 9602 and 9611*
small community	Developed area with a population of less than 10,000.
State Plan of Flood Control	Means the state and federal flood control works, lands, programs, plans, policies, conditions, and mode of maintenance and operations of the Sacramento River Flood Control Project Described in Section 8350 of the California Water Code (CWC), and of flood control projects in the Sacramento River and San Joaquin River watersheds authorized pursuant to Article 2 (commencing with Section 12648) of Chapter 2 of Part 6 of Division 6 for which the Board or the Department has provided the assurances of nonfederal cooperation to the United States, and those facilities identified in CWC Section 8361. *California Water Code Section 9110 (f)*
State Plan of Flood Control Descriptive Document	The State Plan of Flood Control Descriptive Document is an inventory and description of the flood control projects and works (facilities), lands, programs, plans, conditions, and modes of operations and maintenance for the State-federal flood protection system in the Sacramento River and San Joaquin River watersheds and facilities identified in WC Section 8361. The document fulfills part of the legislative requirement expressed in CWC Section 9120 (a) and (b).
State Plan of Flood Control Planning Area	The State Plan of Flood Control (SPFC) Planning Area is the geographic area that includes the lands currently receiving flood damage reduction benefits from the SPFC. The SPFC Planning Area is completely contained within the Systemwide Planning Area.
urban area[2]	A developed area in which there are 10,000 residents or more. *California Government Code Section 65007 (j)*
urbanizing area	A developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years. *California Government Code Section 65007 (k)*
urban levee design criteria	Urban Levee Design Criteria (ULDC) means the levee and floodwall design criteria developed by the California Department of Water Resources for providing the urban level of flood protection. *California Government Code Section 65007(k) and Water Code Section 9602(i)*
urban level of flood protection	Level of protection that is necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year using criteria consistent with, or developed by, the Department of Water Resources. *California Government Code Section 65007(l) and Water Code Section 9602(i)*

[1]Disclaimer: It is important for the reader to understand that a broader definition is often used to describe a project levee as any levee that has been implemented as part of a Federal project. For use with respect to the CVFPP, "project levee" is as defined in the Water Code.

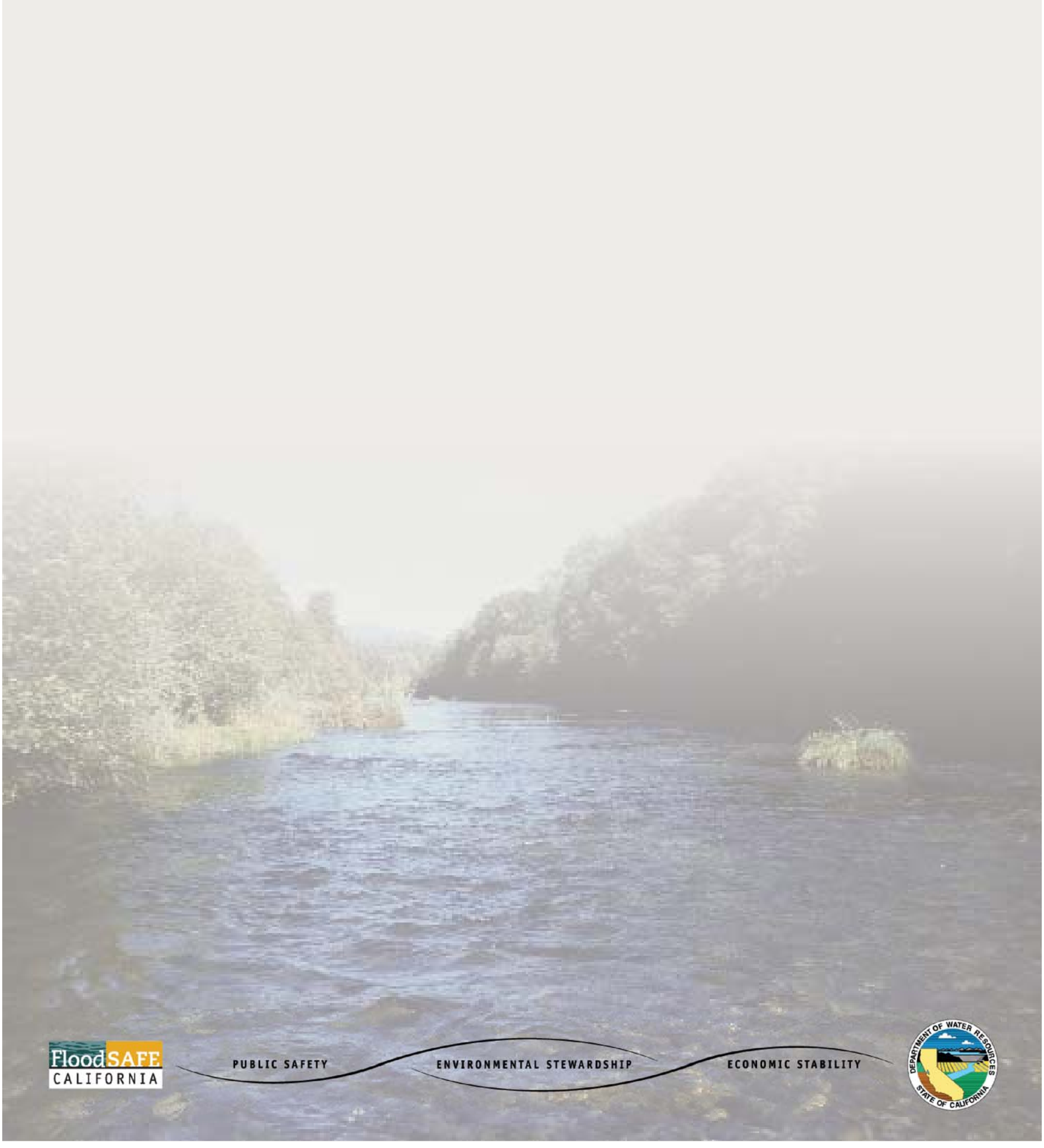
[2]"Urban Area" is also defined in the California Public Resources Code Section 5096.805 (k) as "any contiguous area in which more than 10,000 residents are protected by project levees." For use with respect to the Central Valley Flood Protection Plan, "project levee" is as defined in California Water Code Section 9602(c).

Feather River Region

Regional Flood Atlas–Draft

REGIONAL FLOOD MANAGEMENT PLANNING

FloodSAFE CALIFORNIA



FloodSAFE CALIFORNIA

PUBLIC SAFETY ENVIRONMENTAL STEWARDSHIP ECONOMIC STABILITY

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